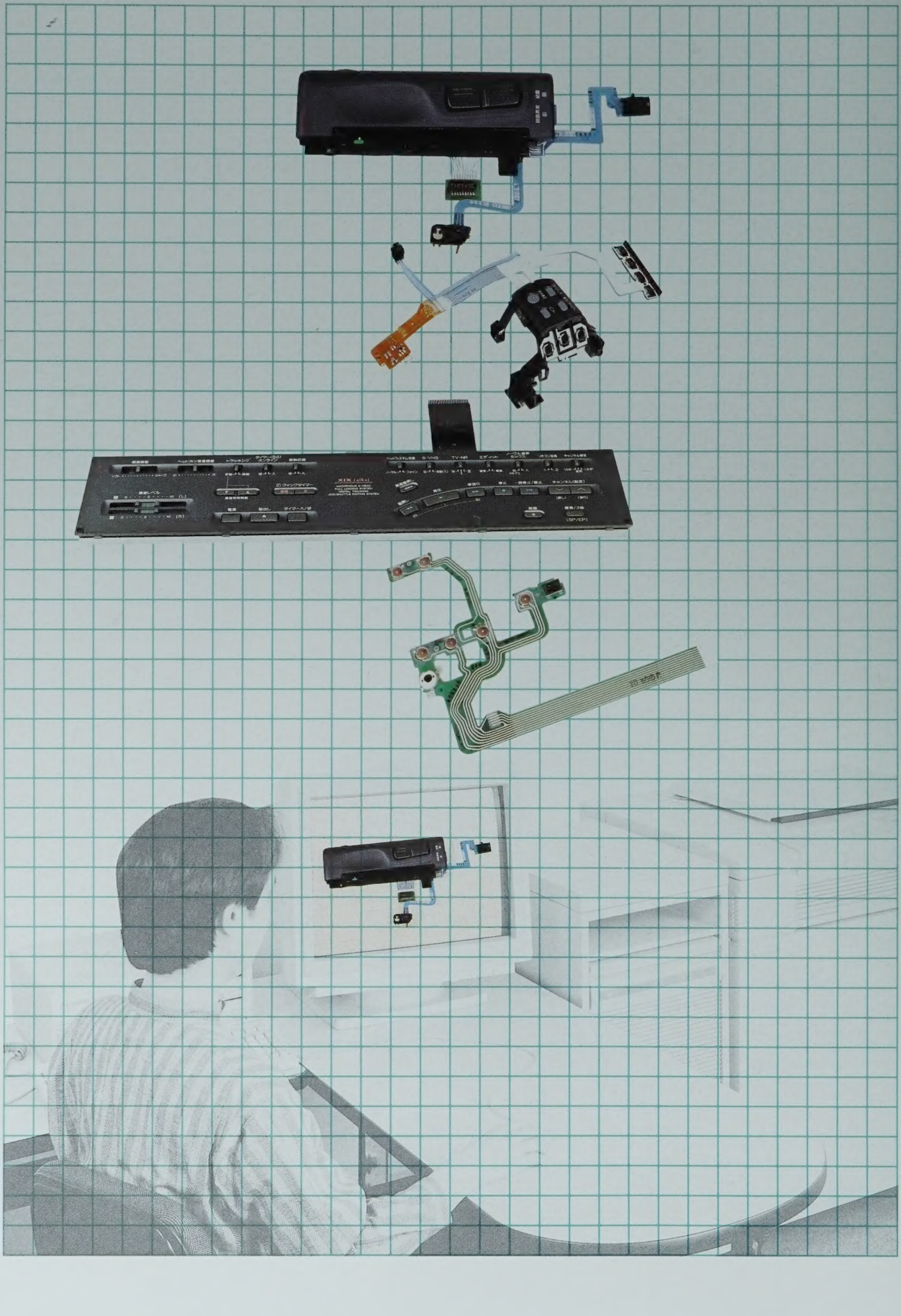
NOBLE '91

ELECTRONIC COMPONENTS CATALOG

TEIKOKU TSUSHIN KOGYO CO., LTD.


トラッキング
タイマー(BS)
オンライン
S-VHS
TV-NR
エディット
ノーマル音声
ミックス
チャンネル
電源
取出し
タイマー入/切
再生
停止
標準/3倍
(SP/EP)

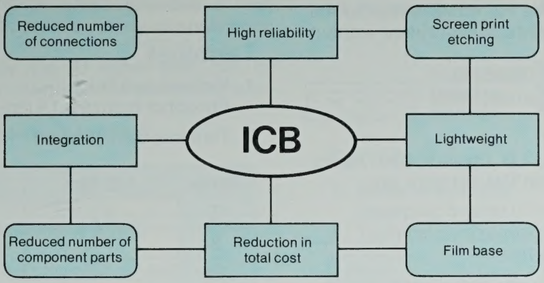
Bringing Design and Electronics Together

The concept behind ICB is technological advancement, and the creation of parts which provide quality in design and performance.

In today's information society, electronics and information are closely linked in an ever — expanding network, in which each component plays a fundamental role in determining the effectiveness and space-efficiency of the whole. When components and techniques are combined effectively, the products which result are far more than just the sum of their parts. NOBLE's ICB technology is founded on this concept. By finding new ways to combine all of the components onto a single block, we have unleashed the full potential of our hardware. Our new ICB features:

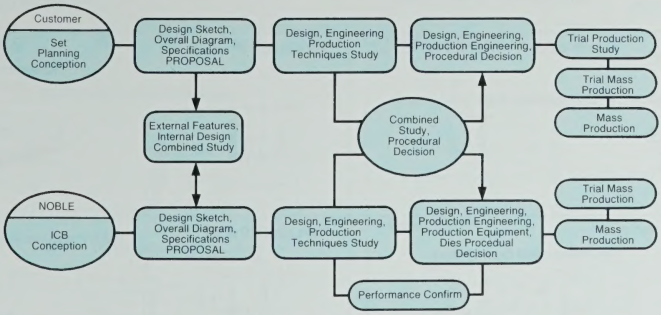
1) A slim, compact shape
2) An adaptable design
3) Improved capabilities and performance
4) Value Analyzed (VA) parts

With our advanced parts and techniques, the capabilities of ICB technology are virtually unlimited. Each part is designed with the ICB concept in mind from the very start, so that the essential parts are integrated effectively — horizontally, vertically and in 3 dimensions. NOBLE has brought design and electronics together in ICB technology; better fulfilling your needs for electronic parts.



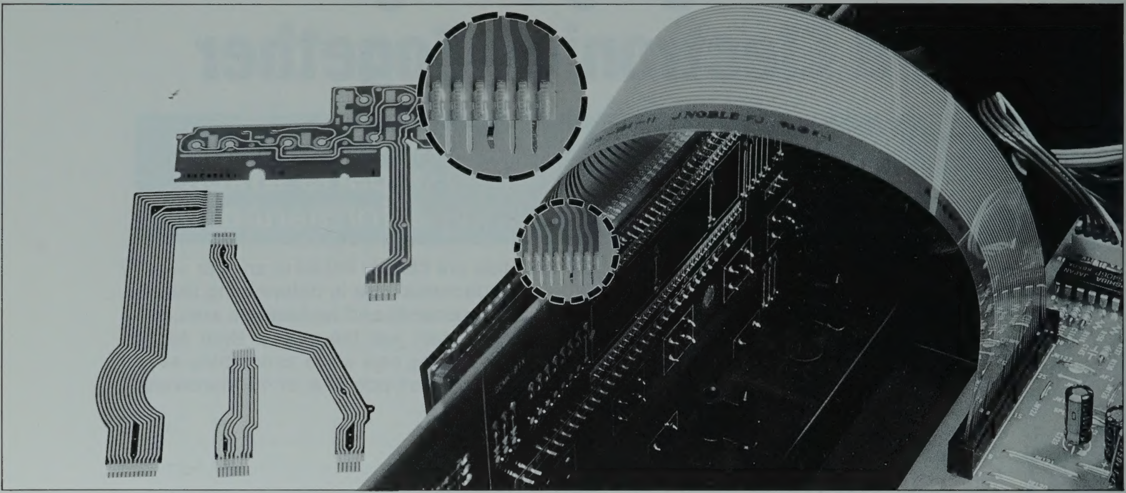
The ICB Development System

The most effective way to incorporate the customer's specific operating needs into the ICB is to involve them directly in the development from the initial planning and conception phase.


Customer
Set Planning Conception
Design Sketch, Overall Diagram, Specifications PROPOSAL
Design, Engineering Production Techniques Study
Design, Engineering, Production Engineering, Procedural Decision
Trial Production Study
Trial Mass Production
Mass Production
External Features, Internal Design Combined Study
Combined Study, Procedural Decision
NOBLE
ICB Conception
Design Sketch, Overall Diagram, Specifications PROPOSAL
Design, Engineering, Production Techniques Study
Design, Engineering, Production Engineering, Production Equipment, Dies Procedual Decision
Trial Mass Production
Mass Production
Performance Confirm

PINFLEX

Flexible Jumper Sheets with Terminals FJ Series



FEATURES

1. The FJ is series of "flexible jumper sheets with terminals" created by NOBLE's high density mounting technology under its ICB (Integrated Control Block) concept.
2. With polyester employed for its base film, the FJ exhibits high bending withstanding capabilities, and provides a high degree of designing freedom to meet a variety of application needs.
3. With solder plated terminals, the FJ, either side, can be directly soldered on circuit boards or equivalent without any connectors.
4. UL. approved type also available (E64519).
5. Patents pending. (Japan, USA, Europe, NIES)

APPLICATIONS

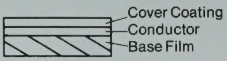
Headphone Stereos, CD Players, LD Players, Car Audio, VCRs, Video Cameras, Liquid Crystal TVs, Printers, etc.

SPECIFICATIONS

Operating Temperature Range	−25 to +70°C
Conductor Resistance	1.5 Ω max. per 10mm length at a 0.6mm conductor width
Maximum Operating Voltage	35V AC/DC
Maximum Current	50mA per l pin for 0.6 mm conductor width

CONSTRUCTION

	Base Film
Standard: Type 01	[0.10 mm PET]
UL Approved: Type 02	[0.10 mm PET]



Number of Terminals: 4 ~32
Maximum Sheet Length: 300 mm
Minimum Conductor Width: 0.6 mm
Minimum Conductor Interval: 0.6 m

Terminal

1. Material and finish
   Phosphor bronze 0.14 mm, with solder plating
2. Terminal configuration

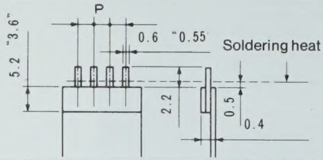
Version	1.25 Pitch	2.0 Pitch	Type
A	2.2	2.2	Straight
B		3.2	Straight
B2		4.2	Straight
D	3.2		Bent at right angles

Custom formed terminals are also possible.
Feel free to consult us.

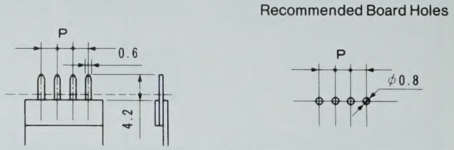
Terminal Configuration

Version A (P=1.25 or P=2.0)

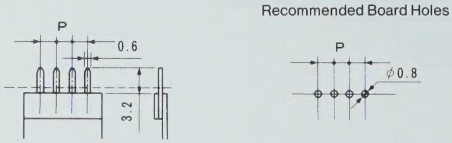
Values inside " " apply to P=1.25



Version B2 (P=2.0)

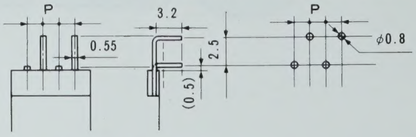


Version B (P=2.0)



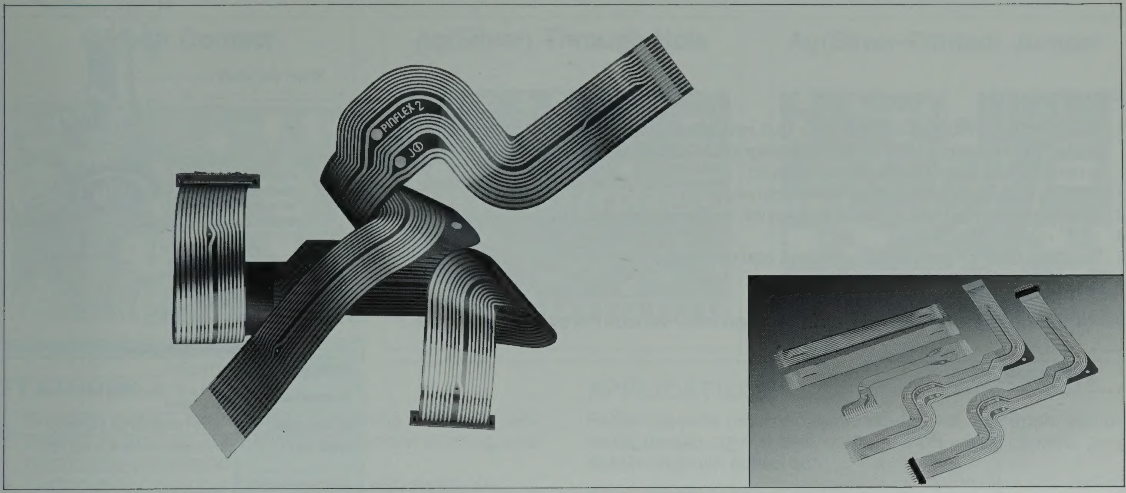
Version D (P=1.25)

(Short terminal locates at far left)



PINFLEX mkII

Flexible Jumper Sheets with Terminals FJ2 Series



FEATURES

1. The FJ2 is an upgraded series which incorporates the NOBLE ICB concept of high-density mounting technology for PINFLEX (FJ series) flexible circuit use.
2. Aluminum film is used for the conductor pattern. The conductor resistance is low and current rating is upgraded.
3. Polyester is employed for the base film. Bending resistance capabilities are superior which provides a high degree of design freedom to meet a variety of application needs.
4. With solderplated terminals, the FJ either side, can be directly soldered on circuit boards or the equivalent without any connectors.
5. UL. approved type also available. (E122733)

SPECIFICATIONS

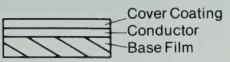
Operating Temperature Range	−25 to +70°C
Conductor Resistance	Reference value at 20°C 0.003 × L/W Ω W: Conductor width, L: Length (mm)
Maximum Operating Voltage	35 V AC/DC
Maximum Current	500 mA per 0.6 mm conductor width. Total 1.5 A per one sheet.

APPLICATIONS

Headphone stereos, CD players, LD players, Car Audio, VCRs, Video Cameras, Liquid Crystal TVs, Printers, etc.

CONSTRUCTION

	Conductor	Base film
Standard: Type 01	[aluminum film 0.012 mm]	[0.075 mm PET]
UL Approved: Type 02	[aluminum film 0.012 mm]	[0.075 mm PET]



Number of Terminals: 4～32
Maximum Sheet Length: 300 mm
Minimum Conductor Width: 0.3 mm
Minimum Conductor Interval: 0.3 mm

Terminal

1. Material and finish
   Phosphor bronze 0.14 mm, with solder plating
2. Terminal configuration

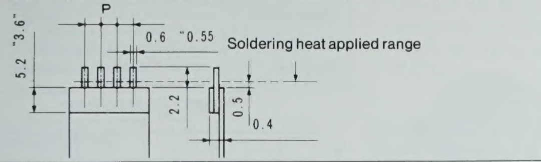
Version	1.25 Pitch	2.0 Pitch	Type
A	2.2	2.2	Straight
B		3.2	Straight
B2		4.2	Straight
D	3.2		Bent at right angles

Custom formed terminals are also possible.
Feel free to consult us.

Terminal Configuration

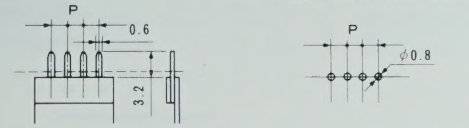
Version A (P=1.25 or P=2.0)

Values inside " " apply to P=1.25



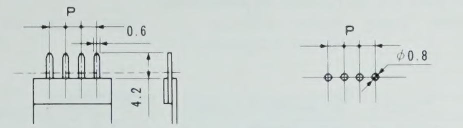
Version B (P=2.0)

Recommended Board Holes



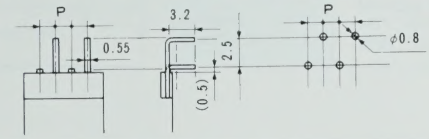
Version B2 (P=2.0)

Recommended Board Holes



Version D (P=1.25)

(Short terminal locates at far left)



FILM-POT

Miniature Potentiometers XVR09

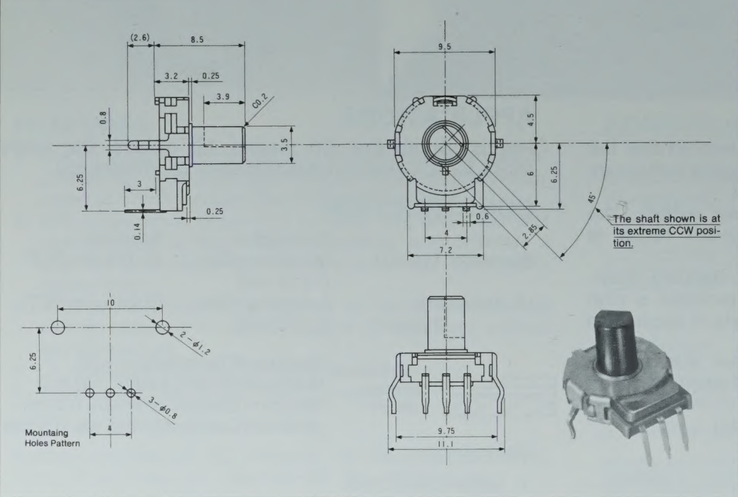
FEATURES

1. FILM-POT (XVR09) is a low profile (3.2 mm height) miniature potentiometer created by incorporating NOBLE's ICB (Integrated Control Block) molding process engineering and base film processing skills.
2. Anti-flux type and withstands wave soldering.
3. With a snap-in metalic housing employed, better withstands static electricity.
4. 270° rotational angle.
5. Ideally suited for low profile, compact equipments.

APPLICATIONS

VCRs, Video Cameras, Liquid Crystal TVs, and other various Portable instruments

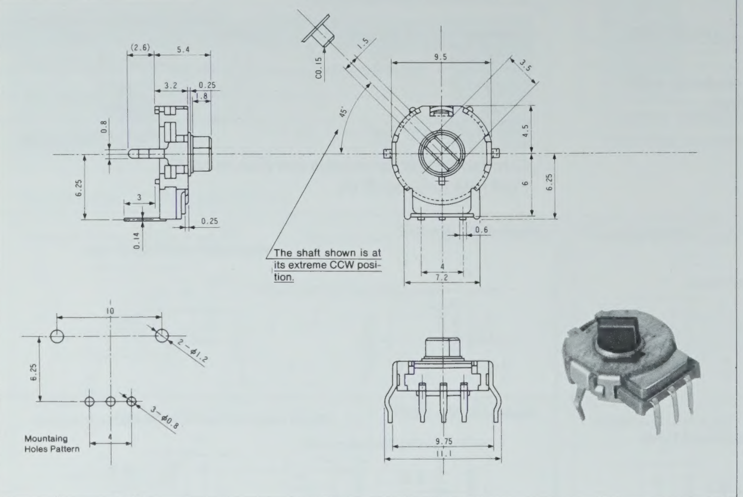
XVR09N8. 5F



The shaft shown is at its extreme CCW position.

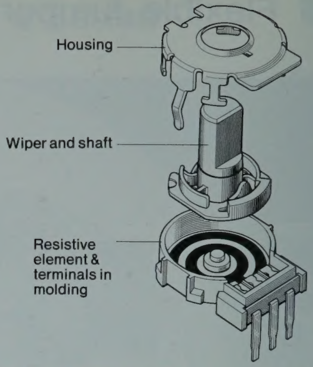
Mountaing Holes Pattern

XVR09N5. 4FF



The shaft shown is at its extreme CCW position.

Mountaing Holes Pattern

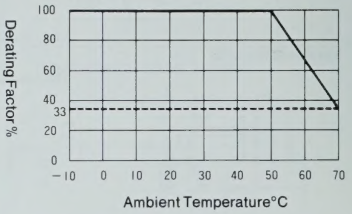


SPECIFICATIONS

Mecanical Characteristics	
Rotation angle	270±5°
Detent position	135±5° (No detent type is also available)
Rotational torque	10 to 100 gf-cm (at 5 to 35°C)
Detent torque	Rotational torque + (15 to 100 gf-cm)
Shaft rotation stopping strength	Withstands 0.8 kgf-cm
Shaft push/pull strength	Withstands 1 kgf
Shaft deflection/bending	After subjection of the shaft tip to a 100 gf/cm bending force applied vertically from each of two directions 180° apart, the shaft deflection will remain within 0.5 × L/10 mmp-p, where L is the test point distance from the mounting surface (unit: mm).
Terminal strength	Withstands 1 kgf

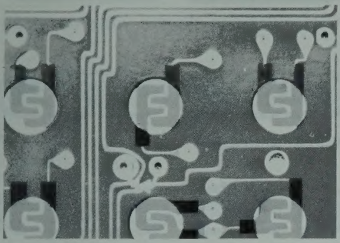
Electrical Characteristics		
Total resistance values	5 kΩ, 10 kΩ, 20 kΩ, 50 kΩ, 100 kΩ, 200 kΩ, 500 kΩ	
Resistance value tolerance	Within ±30%	
Resistance taper	Linear (B) and Audio (15 A)	
Residual resistance	Full Resistance	Residual Resistance
	20 kΩ max.	20 Ω max.
	Above 20 kΩ up to 50 kΩ	50 Ω max.
	Above 50 kΩ up to 100 kΩ	100 Ω max.
	Above 100 kΩ up to 200 kΩ	200 Ω max.
	Above 200 kΩ up to 500 kΩ	300 Ω max.
Power rating	0.05W (provided that at an ambient temperature above 50°C up to 70°C, the maximum permissible power input is held at the rated power level multiplied by a derating factor specified with the derating curve in Fig. 1)	
Voltage rating	10V AC/DC	
Insulation resistance	100M Ω min. (as measured with a 100 V DC megger)	
Dielectric strength	When impressed with 100 V AC for one minute, sustains no damage, arc, or insulation breakdown.	
Sliding noise	100 mV max. when tested by method A stipulated in paragraph 5.8 of JIS C5261-1987	

Figure 1-Derating Curve

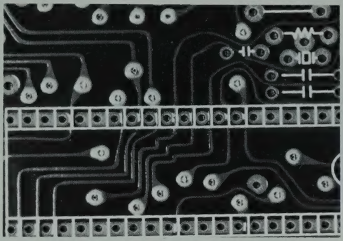


Multi-Functional 2-Sided Printed Circuit Board

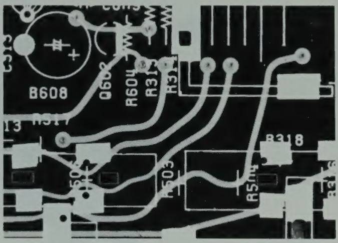
Carbon Contact



Ag(Silver) Through-Hole



Ag(Silver-Printed) Jumper



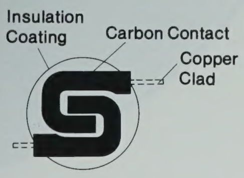
FEATURES

1. Superior overall performance combining NOBLE's advanced technology in carbon printing, silver printing, and mechanical parts design.
2. Carbon print contacts allow integration with switch VA.
3. Ag through-hole cuts cost of p-c board with patterns on both sides, and facilitates high-density packaging.
4. Ag jumper reduces number of assembly steps, saving overall costs.
5. Fixed resistors can also be printed on as necessary.
6. Potentiometer, slide switch, or other mechanical parts can be incorporated into one circuit board.
7. UL standard can be met.

APPLICATIONS

Radio-cassette recorder, audio equipment, electronic equipment, remote control unit, portable VCR, video camera, personal computer, copier etc.

Carbon Contact

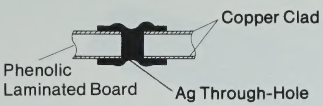


EXAMPLE CARBON CONTACT PATTERN

1. Economical compared with conventional gold plated contacts.
2. Has excellent environmental characteristics.
3. Highly reliable switch can be built by combining with rubber contact switch.

Contact resistance	Less than 500 Ω (using conductive rubber)
Rating	20V DC, 2mA
Operating life	200,000 cycles/150g (20V DC, less than 2mA)

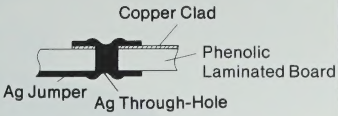
Ag(Silver) Through-Hole



1. Phenol laminated board allows high-density packaging.
2. Unique Ag through-hole method insures high reliability.
3. More economical than glass epoxy P.C.B.

Through-hole resistance	Less than 200mΩ
Through-hole current capacity	300mA
Through-hole pitch	2.5 mm (min).

Ag(Silver-printed) Jumper



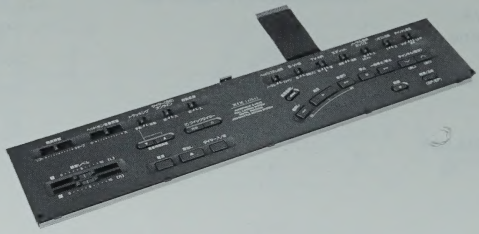
1. Number of assembly steps much smaller than in wire-jumper.
2. Possibility of organized pattern.
3. Jumper formed on the part mounting surface allows more freedom in design of pattern.

Jumper resistance	0.15Ω/□
Jumper current capacity	50mA/0.8mm
Insulation Characteristic	More than 10^2 MΩ (40°C, 90-95%RH, 500hr., 20V)

Control Block IB Series

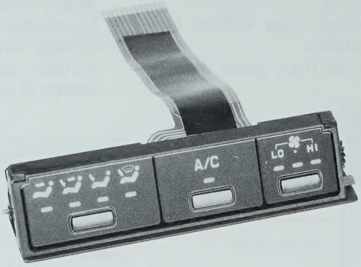
IB-VT-Y0047

IB-VT-Y0055



IB-AC-Y0060

IB-CE-Y0018



IB-VT

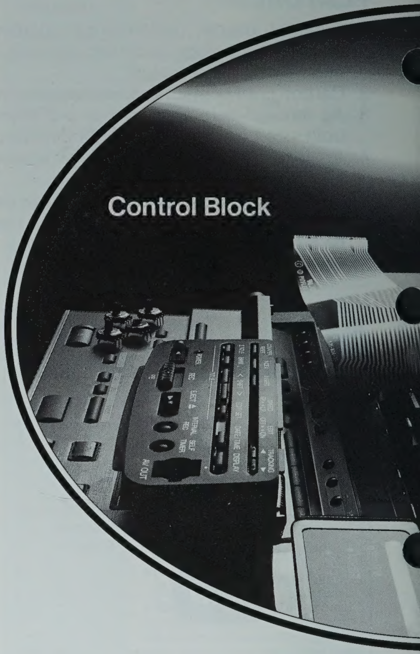
VCRs, videodisc players, video cameras

IB-TV

Regular and liquid crystal TVs

IB-CA

Car audio



IB-CM

Telephones and other types of personal transceivers

IB-CP

Computers and peripheral equipment

IB-BM

Business machines (i.e., copiers)

Control Block IB Series

IB-AU

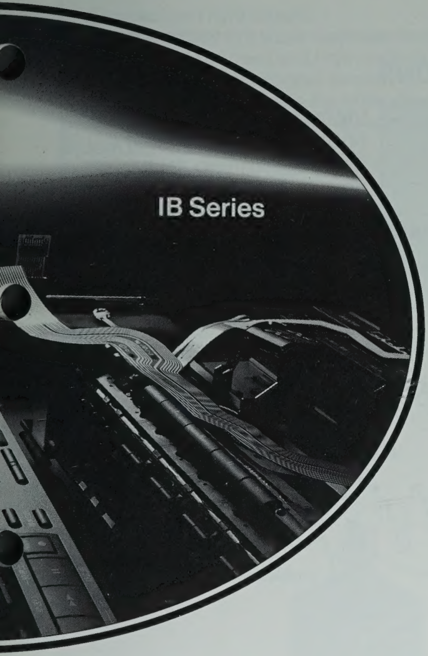
Home audio

IB-CS

Washing machines, refrigerators, cooking appliances

IB-AC

Airconditioners



IB-TM

Electronic measuring equipment

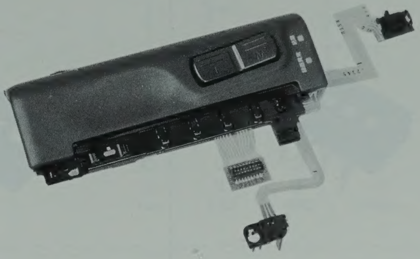
IB-CE

Car electrical system equipment

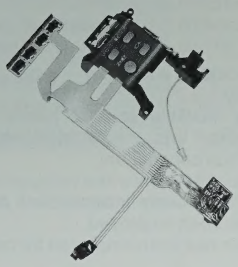
IB-WR

Wireless remote control units

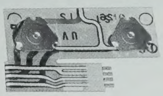
IB-VT-Y0067



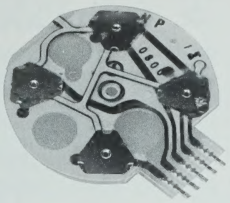
IB-VT-Y0068



IB-CM-Y0004

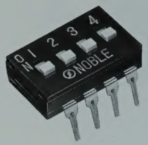


IB-AU-Y0037

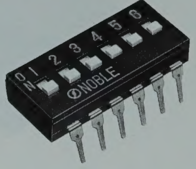


High Contact Reliability DIP Switch SDL Series

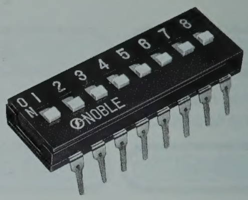
SDL 04RA



SDL 06RA



SDL 08RA

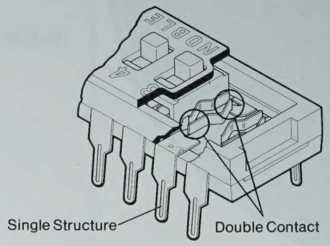


FEATURES

1. Low Profile (5 mm max. including knob tips)
2. High Connection Reliability:
   Pins and corresponding movable contact points have been consolidated together into single elements, for higher reliability of the switch connection.
3. High Contact Reliability:
   For each contact point, a mutually independent double contact point structure has been employed.
   A self-cleaning mechanism has been employed for contact points.
   The switch structure prevents the contamination of contact points by the adhesion of a plastic resin or any other insulator during opening and closing operations of the switch.
   All contact areas have been gold plated.
   The knob operating window has been made dust preventive.
4. High Insulation Reliability:
   An insulator-less, spatially insulating structure has been employed in between contact points, for the elimination of any insulation deterioration.
5. Patent Pending (Japan and U.S.A.)

SPECIFICATIONS

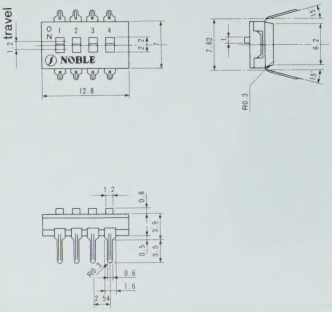
Rating	50V DC, 100mA when unswitched, 24V DC, 25mA when switched
Contact Resistance	50m Ω max. (at 1kHz AC)
Operating force	800gf max.
Operating Temperature Range	−25°C to +70°C
Operating Life	2,000 operations (loaded at 24VDC, 25mA)



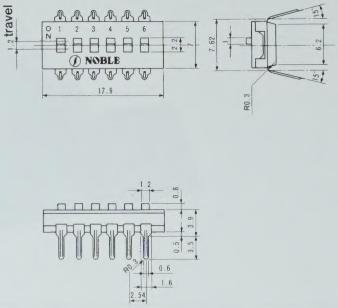
APPLICATIONS

Personal Computers, Printers, Facsimile, various Automatic Vending Machines, etc.

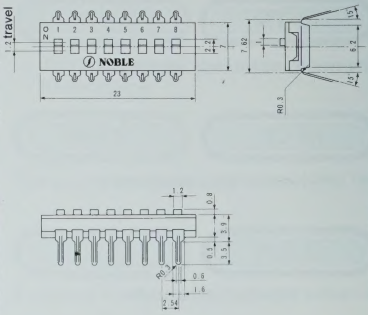
SDL 04RA



SDL 06RA

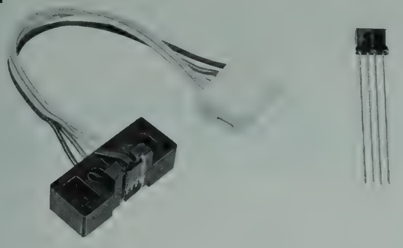


SDL 08RA



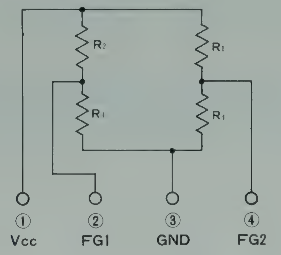
Magnetic (MR) Sensor TDM Series

TDM



0504

TYPICAL CIRCUIT



FEATURES

1. Compact and light weight.
2. High sensitivity in a weak magnetic field.
3. High response speed and high resolution.
4. By virtue of its directional sensitivity, adverse influences of leaked magnetic fields are to be alleviated.
5. No mechanical wear due to non-contact type.
6. Low power consumption.
7. No output dependency on the shifting speed of the magnetic substance.

APPLICATIONS

Capstan motors for VCR, DAT, and HiFi audio; Servo motors for copier and printer, etc.

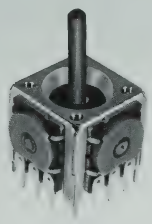
SPECIFICATIONS

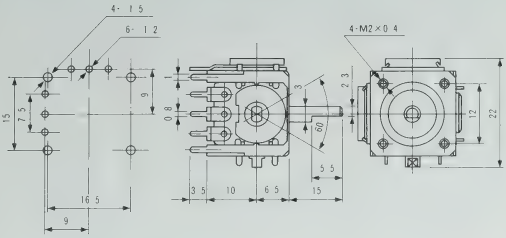
Input Resistance Value	1.0kΩ ±30%
Magneto-Resistance Variation Factor	Without bias magnet: 2% min. (at 100 Oe)
Voltage Rating	5VDC
Neutral Point Voltage	2,500±40mV (at 5VDC applied)
Frequency Response	0 to 200kHz

May be supplied with either a 180° or 90° phase difference between the FG1 and FG2 output signals.

Joystick Control Potentiometer VL201

VL201





FEATURES

1. For both the X and Y axes, low profile rotary potentiometers have been employed to achieve miniaturization.
2. Permits controlling both the X and Y axes simultaneously and speedily.
3. The small operating force facilitates fine adjustments.

APPLICATIONS

Audio Equipment Sound Field Controls, Video Color Controls, Game Machines, Car Audio Equipment, etc.

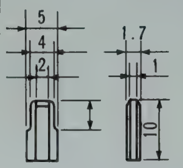
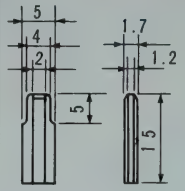
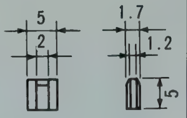
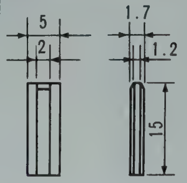
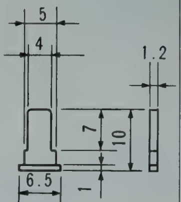
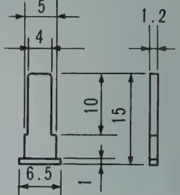
SPECIFICATIONS

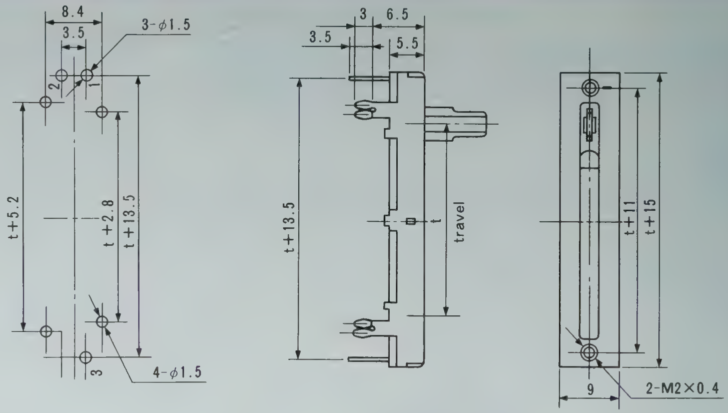
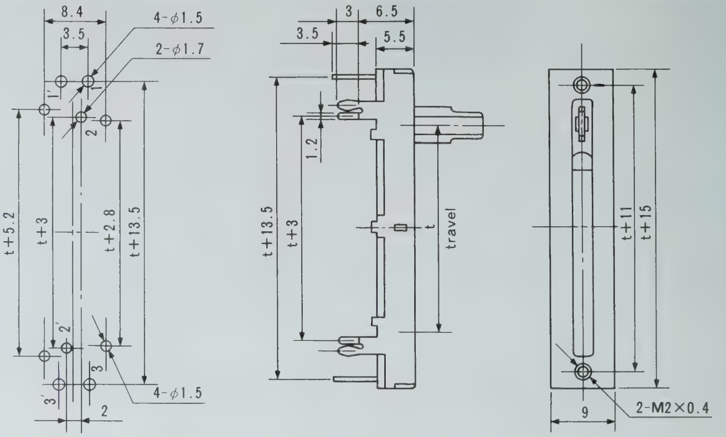
Rotation angle	60±10°
Torque	10 to 100gf-cm
Total resistance range	1kΩ to 500kΩ (taper B)
Power rating	0.01W
Voltage rating	10V AC/DC

Low Profile Slide Potentiometer 13, 23 Series

FEATURES

1. Low-profile potentiometer series: 13 Series (Insulated lever type) and 23 Series (metal lever type).
2. Mounting height is 8mm (-1 type) or 6.5mm (-2 type). Both have free-standing legs with orientation to insure unit is not installed in reverse direction.

13 Series (Insulated Lever)				*23 Series (Metal Lever)	
10C	15C	5B	15B	10CP	15CP
					

Model	Outline Drawings
Single Controls **VJ□□13-2PVN** **VJ□□23-2PVN** travel 	 8.4 3.5 3-φ1.5 2 1 t+5.2 t+2.8 t+13.5 3 4-φ1.5 3 6.5 3.5 5.5 t+13.5 t travel t+11 t+15 9 2-M2×0.4
2-Section **VJ□□13-2GPVN** **VJ□□23-2GPVN** travel 	 8.4 3.5 4-φ1.5 2-φ1.7 1' 2 t+5.2 t+3 t+2.8 t+13.5 2' 3 3' 2 4-φ1.5 3 6.5 3.5 5.5 1.2 t+13.5 t+3 t travel t+11 t+15 9 2-M2×0.4

"t" in outline drawings denotes a travel.

Low Profile Slide Potentiometer 13, 23 Series

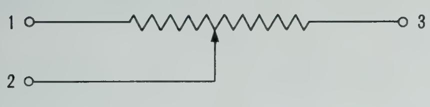
SPECIFICATIONS

Travel	Function	Model	Sliding Force	Resistance Range	Power Rating	Voltage Rating
15 mm	Single	VJ1513-2PVN *VJ1523-2PVN	50～350 gf	1 kΩ～1 MΩ (taper B) 2 kΩ～500 kΩ (other taper)	0.05 W (taper B) 0.025 W (other taper)	10 V DC 100 V AC (taper B) 50 V AC (other taper)
	2-section	VJ1513-2GPVN *VJ1523-2GPVN				
20 mm	Single	VJ2013-2PVN *VJ2023-2PVN	50～350 gf	1 kΩ～1 MΩ (taper B) 2 kΩ～500 kΩ (other taper)	0.06 W (taper B) 0.03 W (other taper)	10 V DC 150 V AC (taper B) 100 V AC (other taper)
	2-section	VJ2013-2GPVN *VJ2023-2GPVN				
30 mm	Single	VJ3013-2PVN *VJ3023-2PVN	50～350 gf	2 kΩ～1 MΩ (taper B) 3 kΩ～1 MΩ (other taper)	0.1 W (taper B) 0.05 W (other taper)	10 V DC 200 V AC (taper B) 150 V AC (other taper)
	2-section	VJ3013-2GPVN *VJ3023-2GPVN				
45 mm	Single	VJ4513-2PVN *VJ4523-2PVN	50～350 gf	2 kΩ～1 MΩ (taper B) 5 kΩ～1 MΩ (other taper)	0.1 W	10 V DC 200 V AC (taper B) 150 V AC (other taper)
	2-section	VJ4513-2GPVN *VJ4523-2GPVN				
60 mm	Single	VJ6013-2PVN *VJ6023-2PVN	50～350 gf	2 kΩ～1 MΩ (taper B) 5 kΩ～1 MΩ (other taper)	0.2 W	10 V DC 250 V AC (taper B) 180 V AC (other taper)
	2-section	VJ6013-2GPVN *VJ6023-2GPVN				

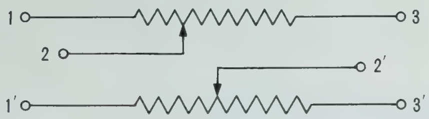
When 10 V DC is exceeded, consultus for further details.

INTERNAL CIRCUIT OF POTENTIOMETERS

Single Control



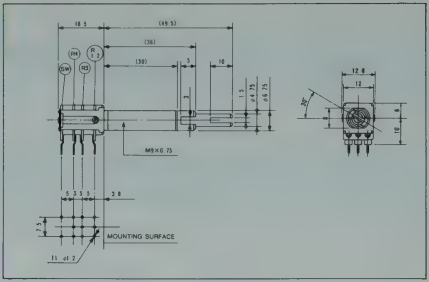
2-Section Control

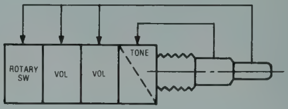


Multi-Section Potentiometer for Car-Audio

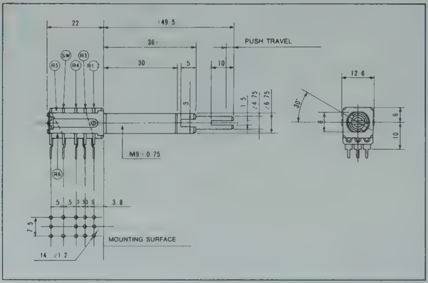
V12L5 Series

V12L5(120X)DG9S (C48)

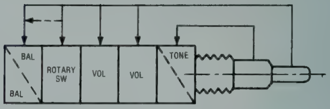




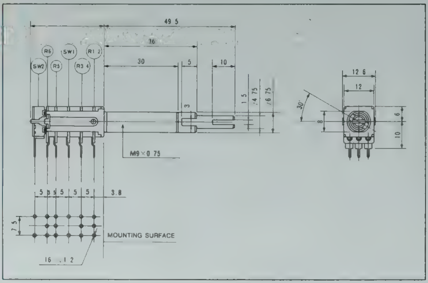
V12L5(120X)(120K) DGM2-3S(C47)



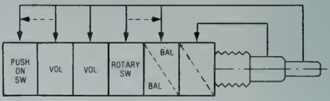
Push-balance



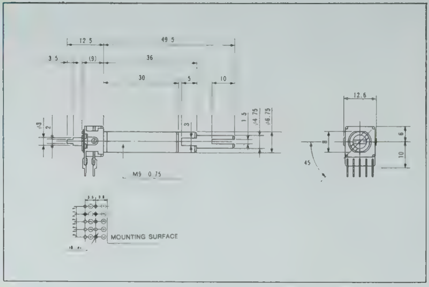
V12L5(120X)(120K) DGM3-2S(C47 + C90)



Pull-balance



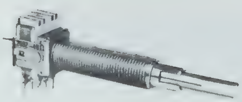
SD12L5DQ1S

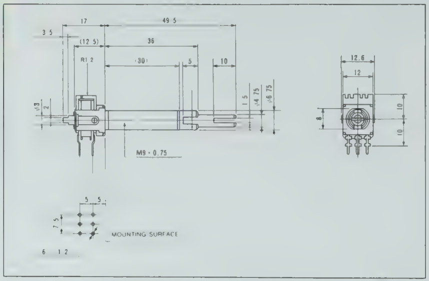


Band Switch with Tuning Shaft

Switching angle	30±5°
Torque	500±250gf-cm
Positions	2, 3 or 4/step
Rating	16VDC, 0.2A
Contact resistance	50mΩ

VM12L5DGQN





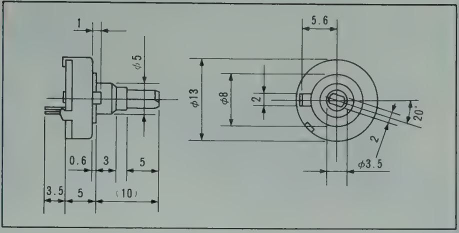
Fader Control with Tuning Shaft

Rotation angle	180±5°
Torque	30-350gf-cm
Resistance range	20Ω-200Ω
Power rating	2.5WDC (8Ω load)
Voltage rating	9VDC

- Other combinations of functions also available. Feel free to consult us.

Long Life Potentiometer

TR133



Operating life	500,000 cycles
Rotation angle	220±5°
Torque	40gf-cm or less
Resistance range	5kΩ-100kΩ (taper B)
Resistance tolerance	±20%
Power rating	0.125W
Voltage rating	10V AC/DC

FEATURES

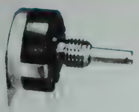
1. Small. Long, reliable service: 500,000 cycles.
2. Resistance element, wiper contacting method and bushing have been originally engineered for high performance.
3. May be operated at low torques.

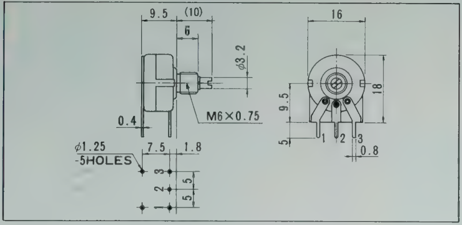
APPLICATIONS

Radio Control Units, Game Machines, Angle Sensors, and other devices for which size and long service are crucial considerations.

Potentiometer for Industrial Applications

RV16YP



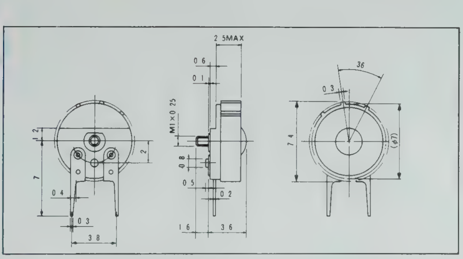


Rotation angle	260±10°
Torque	20-200gf-cm
Resistance range	100Ω-1MΩ (taper B) 500Ω-1MΩ (other taper)
Resistance tolerance	±10%
Power rating	0.1W (taper B) 0.05W (other taper)
Voltage rating	200V (taper B) AC/DC 150V (other taper) AC/DC

Solder lug terminals also available.

Miniature Potentiometer for Hearing Instrument

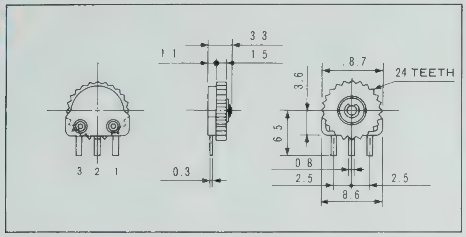
V7N



Sweat-proof type

Rotation angle	200±10°
Torque	3-25gf-cm
Resistance range	500Ω-500kΩ (taper B)
Power rating	0.02W
Voltage rating	10V AC/DC
Operating life	5,000 cycles

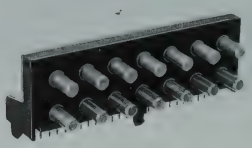
V82N



Rotation angle	260±10°
Torque	3-50gf-cm
Resistance range	500Ω-200kΩ (taper B)
Power rating	0.04W
Voltage rating	10V AC/DC
Operating life	2,000 cycles

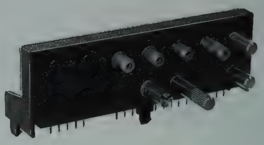
Miniature Potentiometer Block VK82 Series

VK82-14R



VK82-11R

VK82-8R

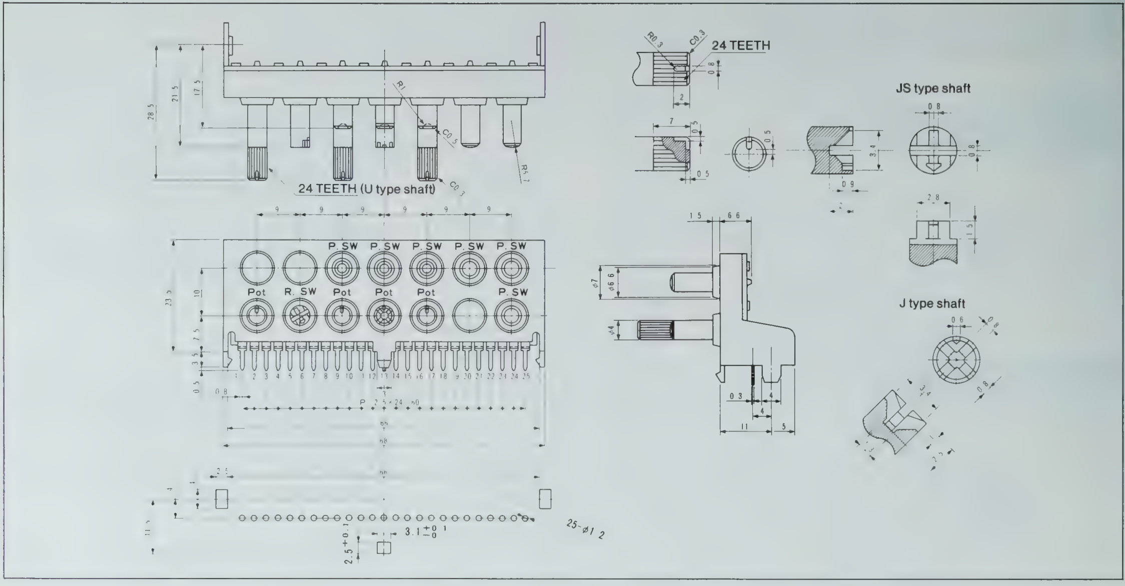


FEATURES

1. These dual row high density blocks have been made 9mm in shaft pitch.
2. The series permits any layout of its potentiometer, rotary switch, and push switch.
3. Either 4 mm or 5 mm diameter shafts available.
4. The problem of insulation distance has been resolved by employing a molded housing.

SPECIFICATIONS

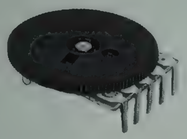
Potentiometer		
	Rotation Angle	280±5°
	Rotational Torque	10 to 100gf-cm (at 5 to 35°C)
	Total Resistance Range	500 Ω to 500k Ω (taper B) 2k Ω to 500k Ω (Other than B)
	Power Rating	0.08W (taper B) 0.04W (Other than B)
	Maximum Operating Voltage	25V AC/DC
Push Switch		
	Travel	0.8±0.3mm
	Operating Force	90±40gf
	Rating	15VDC, 2mA (resistive load)
	Contact Resistance	500 Ω max.
Rotary Switch		
	Rating	15VDC, 2mA (resistive load)
	Contact Resistance	300 Ω max.
	Circuit Configuration	1-circuit, 2-contact 1-circuit, 3-contact

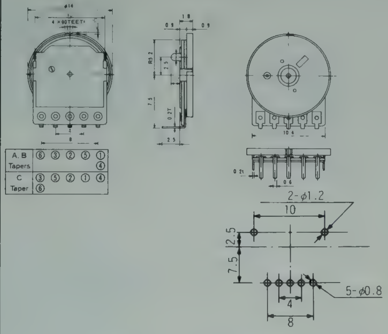


Ultra-Low Profile Tandem Potentiometer

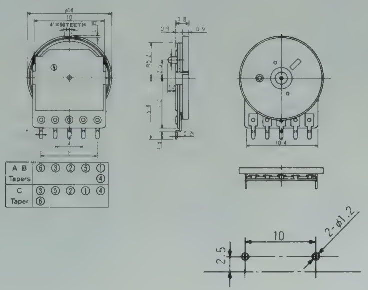
V010LG Series

V010LG(PV)





V010LG(PH)

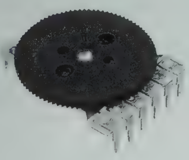


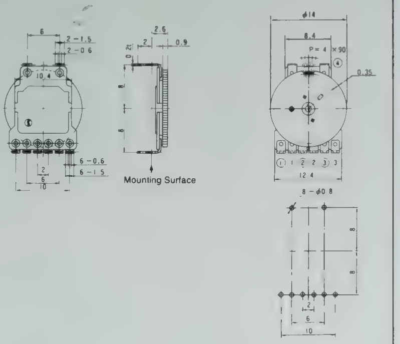
SPECIFICATIONS

Operating Temperature Range	−10°C to +70°C
Storage Temperature Range	−20°C to +70°C
Rotation Angle	270±5°
Rotational Torque	Within 15 to 80gf-cm when measured in a 5 to 35°C ambient temperature environment at a 60° per second rotational speed
Total Resistance Range	5kΩ to 500kΩ (taper B), 10kΩ to 250kΩ (other taper)
Resistance Tolerance	±20%
Resistance Tapers	Tapers A, C and B
Attenuation	80dB min.
Power Rating	0.05W (at or below 50°C ambient temperature)
Voltage rating	10V AC/DC
Tracking Tolerance (Mutual Deviation)	Volume Control: Within ±4dB in a 0 to −40dB range Tone Control: Within ±3dB at the 50% point of a full rotational angle

V010LG-2(PV) for Electronic Tuners

(with built-in Band Switch)





Operating Temperature Range	−10°C to +70°C
Storage Temperature Range	−20°C to +70°C
Rotation Angle	300±5°
Rotational Torque	Within 10 to 80gf-cm when measured in a 5 to 35°C ambient temperature environment at a 60° per second rotational speed
Total Resistance Range	5kΩ to 500kΩ (taper B)
Resistance Tolerance	±20%
Power Rating	0.03W (at or below 50°C ambient temperature)
Voltage rating	35V DC
Tap Position	60% power (by voltage ratio)
Switch Section	
Rating	DC 15V, 50mA
Contact Resistance	3Ω max. (by a voltage drop method at 15VDC, 50mA)
Switch-off Angle	9° max.

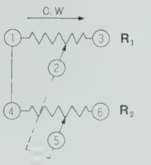
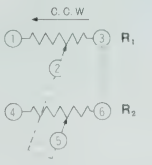
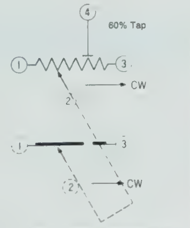
FEATURES

1. Ultra-low profile with 1.8mm thick body and a knob. (Switch incorporating type: 2.6mm)
2. These high performance miniature potentiometers with a planar tandem structure, 10mm in size (Switch incorporating type: 14mm), have been made possible by NOBLE's high precision resistor printing techniques.
3. Volume control models excel in tracking tolerance (mutual deviation) characteristics.
4. Switch incorporating types have been made to permit smooth tuning operations, by minimizing their switch operating angle and flat area in their resistance tapers.

APPLICATIONS

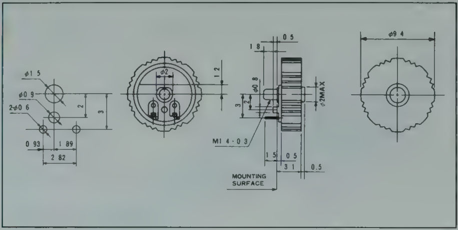
Headphone Stereos, Card Radios, Liquid Crystal TVs, and other Pocketable Equipment.

Circuit

V010LG (PV) (PH)		V010LG-2 (PV) (Built-in Band Switch)
A, B tapers	C taper	
		

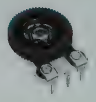
Miniature Potentiometers for Portable Devices

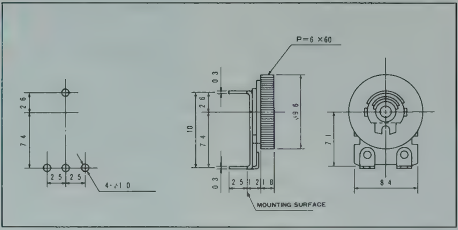
V72N



Rotation angle	200±5°
Torque	5-50gf-cm
Resistance range	500Ω-500kΩ (taper B) 1kΩ-300kΩ (other taper)
Power rating	0.02W
Voltage rating	10V AC/DC

V08LPV-Y8

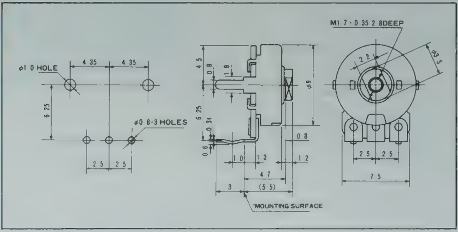




Rotation angle	230±5°
Torque	10-100gf-cm
Resistance range	1kΩ-500kΩ (taper B) 5kΩ-250kΩ (other taper)
Power rating	0.025W
Voltage rating	10V AC/DC

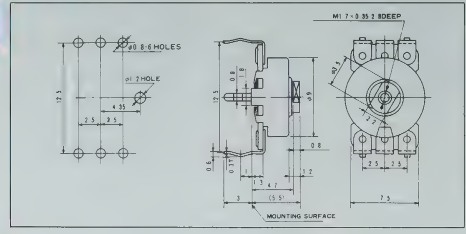
Unit with φ16 knob also available.

V09L



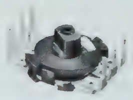
Rotation angle	230±5°
Torque	10-100gf-cm
Resistance range	1kΩ-500kΩ (taper B) 5kΩ-250kΩ (other taper)
Power rating	0.05W (taper B) 0.025W (other taper)
Voltage rating	10V AC/DC

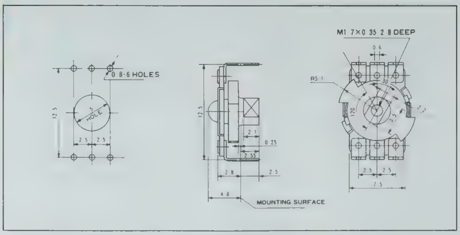
V09LG



Rotation angle	120±5°
Torque	10-100gf-cm
Resistance range	2kΩ-500kΩ (taper B) 5kΩ-250kΩ (other taper)
Power rating	0.05W (taper B) 0.025W (other taper)
Voltage rating	10V AC/DC

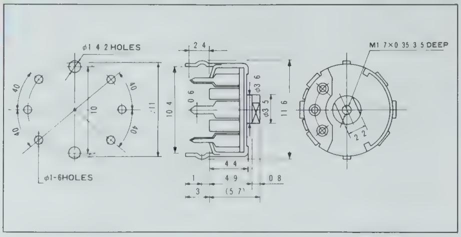
V09L2GPVF





Rotation angle	120±5°
Torque	10-100gf-cm
Resistance range	2kΩ-500kΩ (taper B) 5kΩ-250kΩ (other taper)
Power rating	0.05W (taper B) 0.025W (other taper)
Voltage rating	10V AC/DC

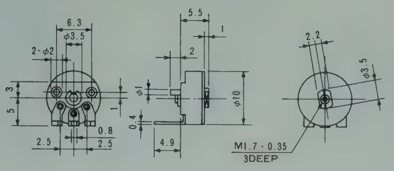
V10L2G3



Rotation angle	230±5°
Torque	10-100gf-cm
Resistance range	1kΩ-500kΩ (taper B) 10kΩ-200kΩ (other taper)
Power rating	0.05W
Voltage rating	30V AC/DC
Tracking tolerance **Volume** **Tone**	0 to −40dB: Within ±4dB ±3dB at 50% point of total rotation

Potentiometers

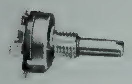
V105-4PVN

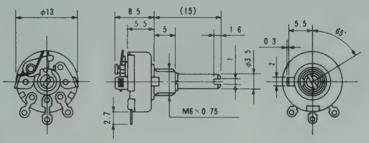


Rotation angle	200±10°
Torque	20-150gf-cm
Resistance range	1kΩ-500kΩ (taper B) 1KΩ-500kΩ (other taper)
Power rating	0.07W (taper B) 0.03W (other taper)
Voltage rating	100V (taper B) AC/DC 70V (other taper) AC/DC

V12M4-1S

(with Switch)



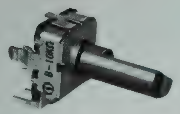


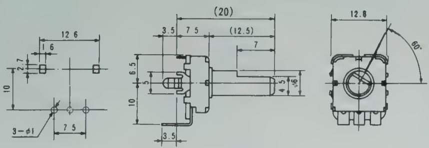
Rotation angle	230±10°
Torque	20-200gf-cm
Resistance range	1kΩ-500kΩ (taper B) 5kΩ-500kΩ (other taper)
Power rating	0.08W (taper B) 0.04W (other taper)
Voltage rating	150V (taper B) AC/DC 100V (other taper) AC/DC
Switch rating	12VDC, 0.5A

Units without switch also available.

V012LPV

(Insulated Shaft)



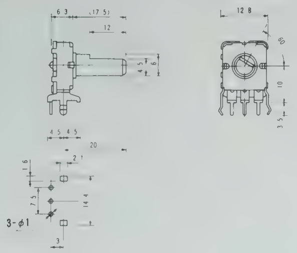


Rotation angle	300±5°
Torque	30-200gf-cm
Resistance range	500Ω-500kΩ (taper B) 5kΩ-500kΩ (other taper)
Power rating	0.15W (taper B) 0.08W (other taper)
Voltage rating	150V AC (taper B) 100V AC (other taper) / 10V DC

Units with center-detent also available.

V012LPH

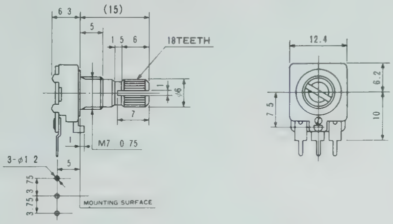
(Insulated Shaft)



Rotation angle	300±5°
Torque	30-200gf-cm
Resistance range	500Ω-500kΩ (taper B) 5kΩ-500kΩ (other taper)
Power rating	0.15W (taper B) 0.08W (other taper)
Voltage rating	150V AC (taper B) 100V AC (other taper) / 10V DC

Units with center-detent also available.

VB12LPHN

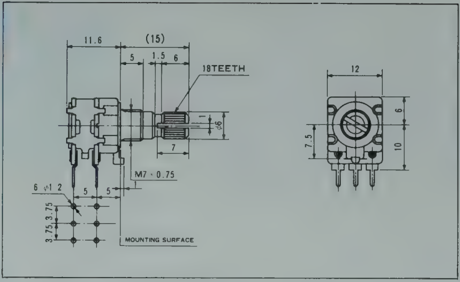


Rotation angle	300±5°
Torque	20-250gf-cm
Resistance range	1kΩ-500kΩ (taper B) 5kΩ-500kΩ (other taper)
Power rating	0.05W
Voltage rating	30V AC

Units with center-detent also available.

Potentiometers

V12LG3PHN



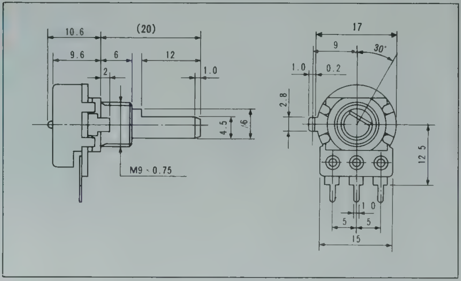
1-Shaft 2-Section

Rotation angle	300±5°
Torque	20-250gf-cm
Resistance range	1kΩ-500kΩ (taper B) 5kΩ-500kΩ (other taper)
Power rating	0.05W
Voltage rating	30V AC/DC

Units with center-detent, 11 or 31 detents, or with tap available.

VB16L43(PH2D)N

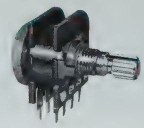
(Insulated Shaft)

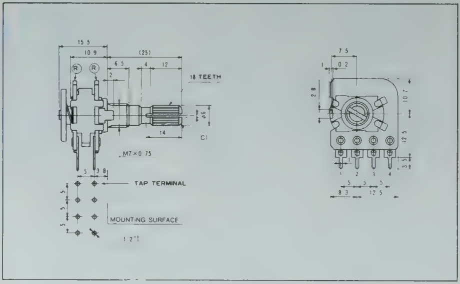


Rotation angle	300±5°
Torque	30-200gf-cm
Resistance range	500Ω-1MΩ (taper B) 5kΩ-1MΩ (other taper)
Power rating	0.15W (taper B) 0.1W (other taper)
Voltage rating	200V AC (taper B) 150V AC (other taper) /10V DC

Units with center-detent or 11-detent available. Units with metal shaft also available (VB16L4PHN).

VB16L4G3-2(PH2D)N





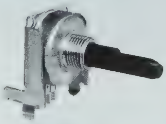
1-Shaft 2-Section

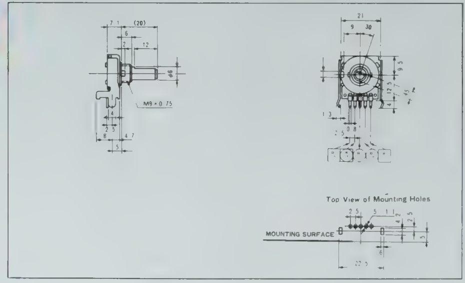
Rotation Angle	300±5°
Torque	30 to 250gf-cm
Resistance Range	500Ω-1MΩ (taper B) 5kΩ-1MΩ (other taper)
Power Rating	0.125W (taper B) 0.06W (other taper)
Voltage Rating	200V AC (taper B) 150V AC (other taper) /10V DC

Units with center-detent 11, 21, 31, or 41 detents also available. (The drawing shows a unit with Multi-detent and Tap.)

VB161GPH

(Insulated Shaft)





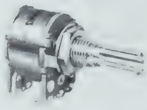
1-Shaft 2-Section (Planar Tandem)

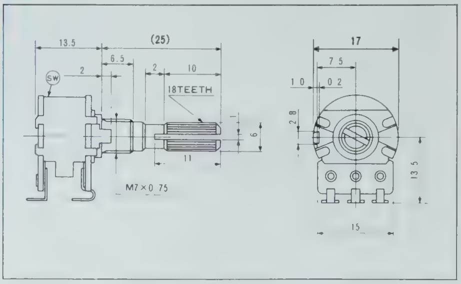
Rotation Angle	300±5°
Torque	30 to 300gf-cm
Resistance Range	1kΩ-500kΩ (taper B) 5kΩ-500kΩ (other taper)
Power Rating	0.06W
Voltage Rating	10V AC/DC

Units with center-detent or 11-detent, dual concentric shafts, a planar block version of the VK16 type, also available.

V16L4S(C23)

(with Switch)

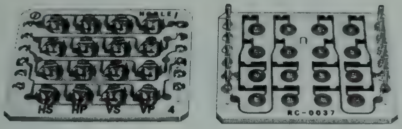


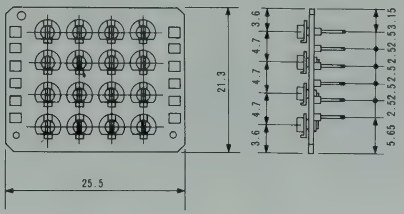


Rotation angle	300±5°
Torque	30-200gf-cm
Resistance range	500Ω-1MΩ (taper B) 5kΩ-1MΩ (other taper)
Power rating	0.2W (taper B) 0.1W (other taper)
Voltage rating	200V (taper B) AC/DC 150V (other taper) AC/DC
Switch rating	12V DC, 1A (SPDT)

Metal-glazed Trimmer Block BM Series

BME type

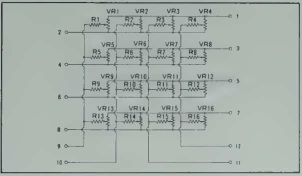




FEATURES

1. Metal glazed elements are deposited on a ceramic substrate for increased reliability and stability.
2. Compact modular block containing trimmer potentiometers and fixed resistors.

Circuit (Example)



SPECIFICATIONS

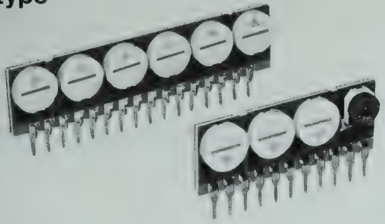
Electrical characteristics	
Resistance range: **Trimmer potentiometer** **Fixed resistor**	 100Ω to 1MΩ (taper B) 10Ω to 1MΩ
Power rating	0.03W
Voltage rating	9V AC/DC max. per element

Mechanical characteristics (trimmer potentiometer)	
Rotation angle	180±20°
Rotational torque	10 to 100gf-cm

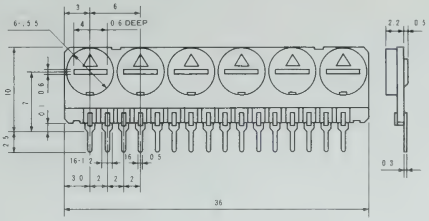
Vertical mount type (BMS) also available.

Carbon Film Trimmer Block BC Series

BCS type



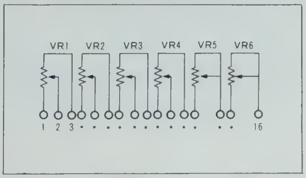
(Chip Style Metal Glazed Trimmer Potentiometer with TMC4K elements mounted on)



FEATURES

1. The glass epoxy substrate used for this trimmer potentiometer exhibits high reliability and stability.
2. Fixed resistors may also be created by simultaneous printing processes, to provide composite blocks.

Circuit (Example)

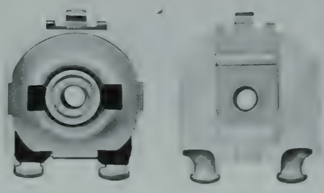


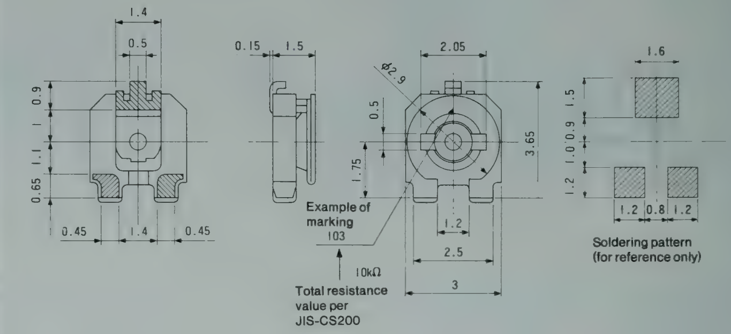
SPECIFICATIONS

Rotation angle	210±20° (effective angle)
Resistance range	500Ω to 500kΩ (taper B)
Resistance tolerance	±30%
Power rating	0.03W
Voltage rating	9V AC/DC

Above photos and drawings are shown as custom-made examples only. Many configurations are possible. Please consult us for more information.

Surface Mount Trimmer Potentiometer TMC3K (Metal-glazed Type)





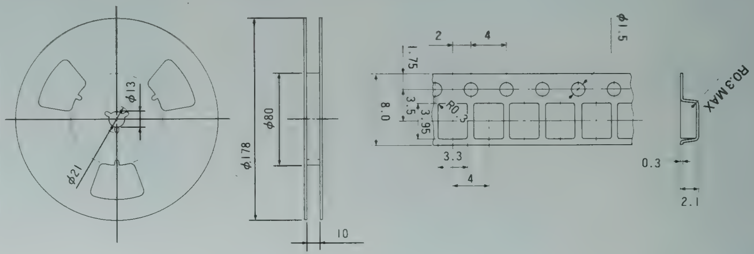
Example of marking 103

10kΩ

Total resistance value per JIS-CS200

Soldering pattern (for reference only)

TMC3K Taping (Holds, 2000 parts)



FEATURES

1. Space Saving Size;
   Outside dimensions: 3.0 mm ×3.65 mm
   Thickness 1.5 mm
2. Easily adjusts with standard screwdriver.
3. Metal-glaze resistance element gives excellent stability and protection against environmental factors.
4. Can be mounted to a circuit board with adhesive.
5. Designed for reflow soldering.
6. Supplied in 8 mm tape for automatic assembly equipment.

APPLICATIONS

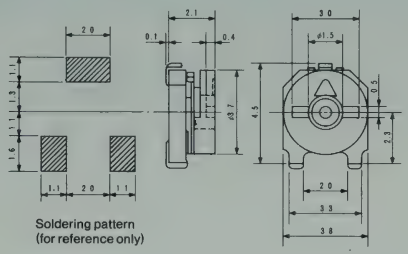
Camera built-in VCR, 8mm VCR, VCR camera, still camera, headphone stereos, LCD television, disk drive, bar code equipments, radar detectors, hand held equipments.

SPECIFICATIONS

Operating temperature range	−55°C to +125°C
Mechanical Characteristics	
Total rotation angle	Endless
Effective rotation angle	250±20°
Rotational torque	20 to 200 gf-cm (5°C to 35°C)
Electrical Characteristics	
Total resistance range and tolerance	100 Ω to 2 MΩ ±25%
Resistance taper	B (Linear)
Residual resistance	Less than 1% of total resistance (300 Ω and below; 3 Ω Max.)
Power rating	0.1 W
Voltage rating	20V AC/DC
Resistance temperature coefficient	Nominal resistance value less than 100 kΩ: ±250 ppm/°C Nominal resistance value 100 kΩ to 1 MΩ: ±250 ppm/°C

Surface Mount Trimmer Potentiometer TMC4K (Metal-glazed Type)

TMC4K



FEATURES

1. Small: 3.8 × 4.5mm.
2. Low profile at 2.1mm thick. Adjustable with a flat-bit screwdriver.
3. Bonding agent can be used for mounting onto a PCB.
4. Allows reflow soldering processes.
5. Taped units also available for automatic mounting.

APPLICATIONS

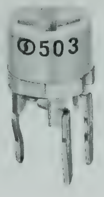
Camcorders, 8mm VCRs, Video Cameras, Still Cameras, Headphone Stereo sets, LCD TV sets, Radar Detectors, etc.

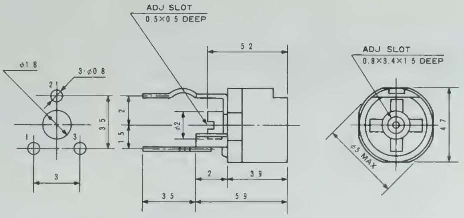
SPECIFICATIONS

Rotation angle	250±20° (effective angle)
Torque	20 to 200gf-cm
Resistance range	100 Ω to 2 MΩ (taper B)
Resistance tolerance	±25%
Power rating	0.2W
Voltage rating	20V AC/DC
Temperature coefficient	Less than 100 kΩ: ±250 ppm/°C 100 kΩ to 1 MΩ: ±250 ppm/°C

Miniature Metal-glazed Trimmer Potentiometer VM5CK

VM5CK





FEATURES

1. Ultra miniaturized with mounting terminals: comparable to chip types (5 ϕ max., 5.9mm high).
2. Snap-in mounting onto a PCB and dip soldering are possible.
3. Dust proof. Auto-adjusting knob.
4. Permits bottom adjustments.
5. Metal glazed resistance element features high stability and excellent environmental characteristics.
6. Magazine-pack also available for automatic insertions.

APPLICATIONS

Small TV sets, LCD TV sets, Camcorders, Video Cameras, Compact VCRs, Car Audio Equipment, Micro Audio Equipment, and other compact consumer and industrial equipment.

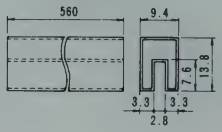
SPECIFICATIONS

Rotation angle	200±20°
Torque	20 to 200gf-cm
Resistance range	100 Ω to 1M Ω (taper B)
Resistance tolerance	±25%
Power rating	0.2W
Voltage rating	100V AC/DC
Temperature coefficient	Less than 100k Ω: ±200ppm/°C 100k Ω to 1M Ω: ±300ppm/°C

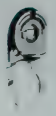
Carbon Film Trimmer Potentiometer V6EK Series

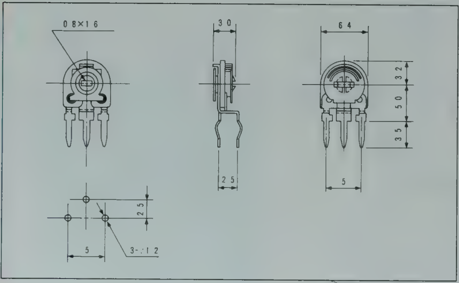
FEATURES

1. Trimmer potentiometer with carbon film resistor formed on a glass epoxy substrate.
2. Ideal for equipment requiring high environmental durability, especially against temperature and humidity.
3. Automatic insertions and adjustments possible. Compact, space-saving design.

Magazine-pack for automatic insertion	Contents
V6EK-PV (1S) 	80 pcs

V6EK-PH



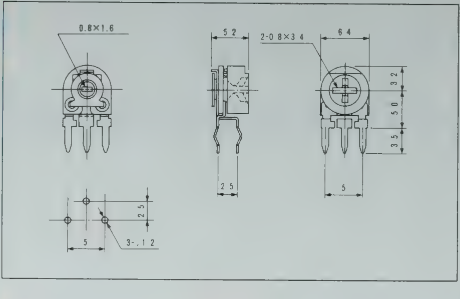


Rotation angle	200±10°
Torque	30-300gf-cm
Resistance range	500Ω-1MΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	50V AC/DC

Front-rear adjustable type

V6EK-PH(1S)

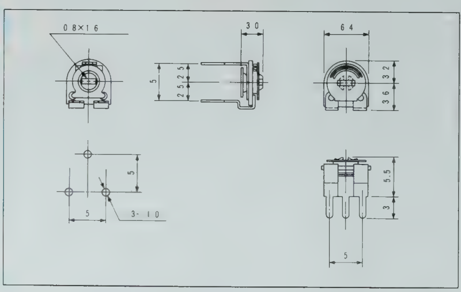
(with Dust-proof Knob)



Rotation angle	200±10°
Torque	30-300gf-cm
Resistance range	500Ω-1MΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	50V AC/DC

Front-rear adjustable type

V6EK-PV

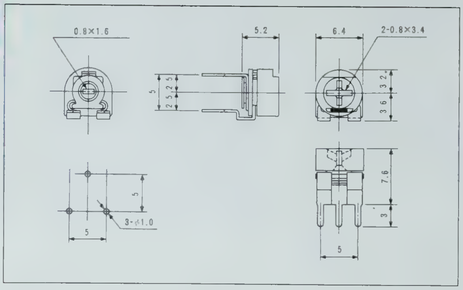


Rotation angle	200±10°
Torque	30-300gf-cm
Resistance range	500Ω-1MΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	50V AC/DC

Top-bottom adjustable type

V6EK-PV(1S)

(with Dust-proof Knob)



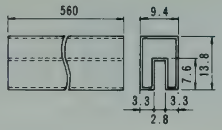
Rotation angle	200±10°
Torque	30-300gf-cm
Resistance range	500Ω-1MΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	50V AC/DC

Top-bottom adjustable type

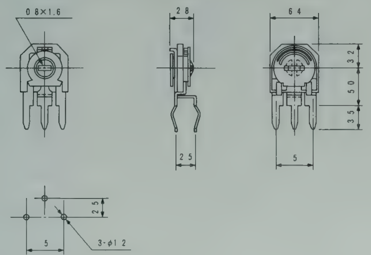
Metal-glazed Trimmer Potentiometer VM6CK Series

FEATURES

1. Metal glazed resistor element with a ceramic substrate as base.
2. Highly stable trimmer potentiometer with temperature coefficient less than ±200ppm (500 Ω to 100k Ω).
3. Automatic insertions and adjustments possible. Compact, space-saving design.

Magazine-pack for automatic insertion	Contents
VM6CK-PV (1S) 	80 pcs

VM6CK-PH

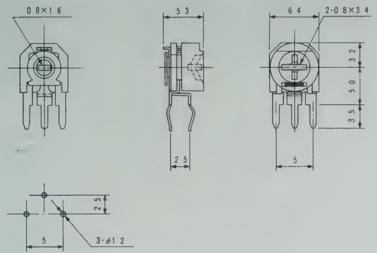


Rotation angle	200±10°
Torque	30-300gf-cm
Resistance range	200 Ω-1M Ω (taper B)
Resistance tolerance	±20%
Power rating	0.3W
Voltage rating	100V AC/DC
Temperature coefficient	±200ppm/°C (500 Ω-100k Ω)

Front-rear adjustable type

VM6CK-PH(1S)

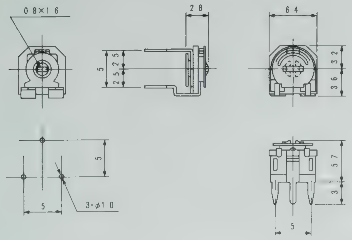
(with Dust-proof Knob)



Rotation angle	200±10°
Torque	30-300gf-cm
Resistance range	200 Ω-1M Ω (taper B)
Resistance tolerance	±20%
Power rating	0.3W
Voltage rating	100V AC/DC
Temperature coefficient	±200ppm/°C (500 Ω-100k Ω)

Front-rear adjustable type

VM6CK-PV

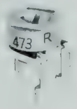


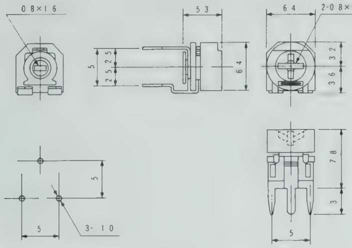
Rotation angle	200±10°
Torque	30-300gf-cm
Resistance range	200 Ω-1M Ω (taper B)
Resistance tolerance	±20%
Power rating	0.3W
Voltage rating	100V AC/DC
Temperature coefficient	±200ppm/°C (500 Ω-100k Ω)

Top-bottom adjustable type

VM6CK-PV(1S)

(with Dust-proof Knob)



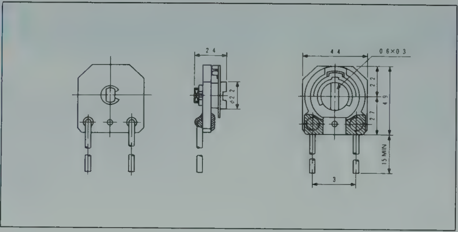


Rotation angle	200±10°
Torque	30-300gf-cm
Resistance range	200 Ω-1M Ω (taper B)
Resistance tolerance	±20%
Power rating	0.3W
Voltage rating	100V AC/DC
Temperature coefficient	±200ppm/°C (500 Ω-100k Ω)

Top-bottom adjustable type
Auto-adjustable Hexagonal Screwdriver also available
[VM6CK-PV(4E)]

Metal-glazed Trimmer Potentiometers

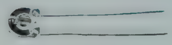
TM4K5-2

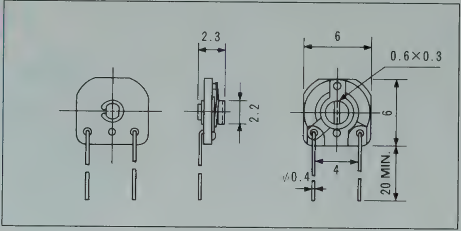


Rotation angle	240°
Torque	10-100gf-cm
Resistance range	50Ω-500kΩ (taper B)
Resistance tolerance	±30%
Power rating	0.05W
Voltage rating	6V AC/DC
Temperature coefficient	±250ppm/°C (500Ω-100kΩ)
Operating life	20 cycles

TF4K type (metal film) is supplied for resistances below 500Ω.

TM6K3-2



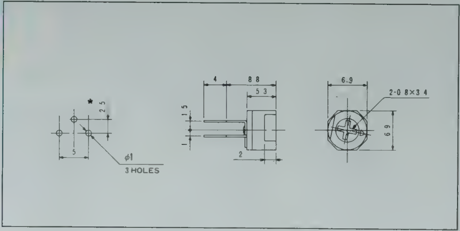


Rotation angle	230°
Torque	20-150gf-cm
Resistance range	50Ω-500kΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	50V AC/DC
Temperature coefficient	±250ppm/°C (500Ω-100kΩ)
Operating life	50 cycles

TF6K type (metal film) is supplied for resistances below 500Ω. Three-terminal type (TM6K3-3) also available.

TM64K2(PV)

(with Dust-proof Knob)

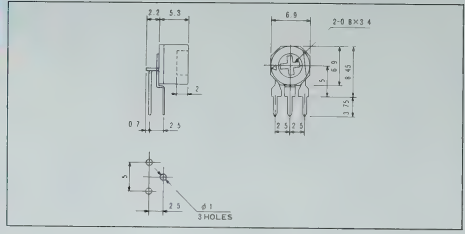


Rotation angle	200±10°
Torque	30-250gf-cm
Resistance range	100Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.3W
Voltage rating	100V AC/DC
Temperature coefficient	±200ppm/°C (500Ω-100kΩ)
Operating life	50 cycles

Front-rear adjustable type (TM64K3(PV)) also available.
*3.5mm type (TM64K2(PV2)) also available.

TM64K2(PH)

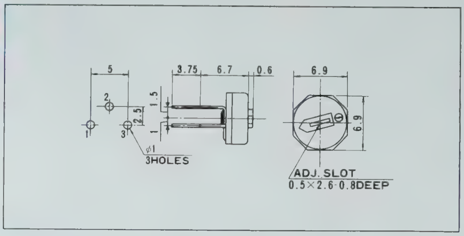
(with Dust-proof Knob)



Rotation angle	200±10°
Torque	30-250gf-cm
Resistance range	100Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.3W
Voltage rating	100V AC/DC
Temperature coefficient	±200ppm/°C (500Ω-100kΩ)
Operating life	50 cycles

TM62K(PV)

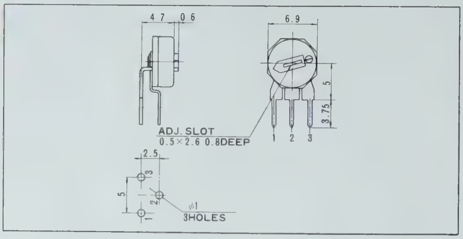
(with Dust-proof Knob)



Rotation angle	200±10°
Torque	20-200gf-cm
Resistance range	100Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.3W
Voltage rating	100V AC/DC
Temperature coefficient	±150ppm/°C
Operating life	50 cycles

TM62K(PH)

(with Dust-proof Knob)

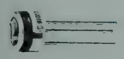


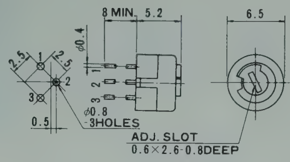
Rotation angle	200±10°
Torque	20-200gf-cm
Resistance range	100Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.3W
Voltage rating	100V AC/DC
Temperature coefficient	±150ppm/°C
Operating life	50 cycles

Metal-glazed Trimmer Potentiometers

TM065P(PVB)

(Enclosed Type)

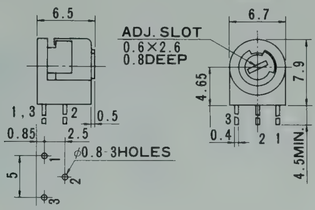




Rotation angle	230±10°
Torque	30—150gf-cm
Resistance range	50Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.5W
Voltage rating	200V AC/DC
Temperature coefficient	±100ppm/°C (100Ω-100kΩ)
Operating life	200 cycles

TM065P(PH)

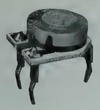
(Enclosed Type)

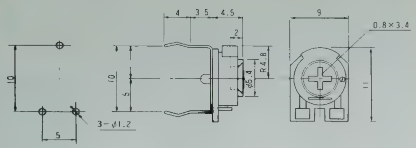


Rotation angle	230±10°
Torque	30—150gf-cm
Resistance range	50Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.5W
Voltage rating	200V AC/DC
Temperature coefficient	±100ppm/°C (100Ω-100kΩ)
Operating life	200 cycles

TM8KV2-1S

(With Dust-proof Knob)



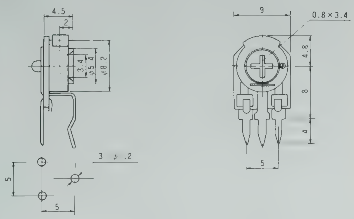


Rotation angle	260±10°
Torque	30-300gf-cm
Resistance range	200Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.5W
Voltage rating	250V AC/DC
Temperature coefficient	±200ppm/°C (200Ω-100kΩ)
Operating life	100 cycles

6mm height, Hex driver adjust, and top-bottom adjustable knobs also available.

TM8KH1-1S

(With Dust-proof knob)

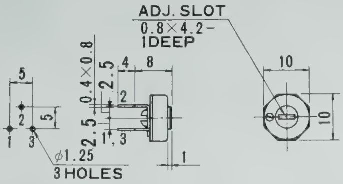


Rotation angle	260±10°
Torque	30-300gf-cm
Resistance range	200Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.5W
Voltage rating	250V AC/DC
Temperature coefficient	±200ppm/°C (200Ω-100kΩ)
Operating life	100 cycles

6mm length, Hex driver adjust, and front-rear adjustable knobs also available.

TM10K(PV)

(With Dust-proof knob)

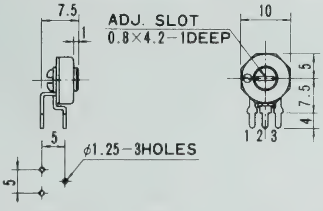


Rotation angle	200±10°
Torque	30-350gf-cm
Resistance range	100Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.5W
Voltage rating	200V AC/DC
Temperature coefficient	±300ppm/°C
Operating life	100 cycles

8mm and 15mm height knob also available.

TM10K(PH)

(With Dust-proof knob)

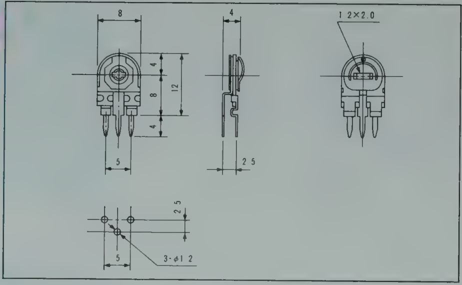


Rotation angle	200±10°
Torque	30-350gf-cm
Resistance range	100Ω-1MΩ (taper B)
Resistance tolerance	±20%
Power rating	0.5W
Voltage rating	200V AC/DC
Temperature coefficient	±300ppm/°C
Operating life	100 cycles

8mm and 15mm length knobs also available.

Carbon Film Trimmer Potentiometer V8K Series

V8K1-1

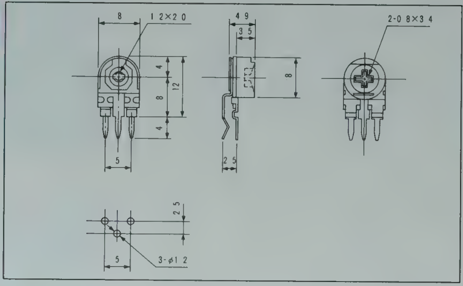


Rotation angle	280±10°
Torque	50-350gf-cm
Resistance range	500Ω-1MΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	100V AC/DC

Snap-in type (V8K1-11) also available.

V8K1-11(1S)

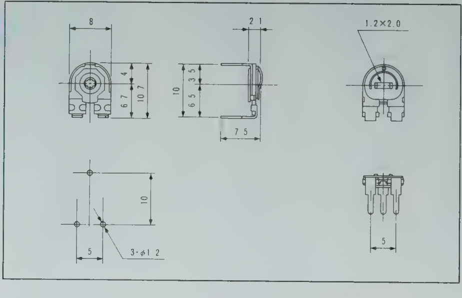
(with Dust-proof Knob)



Rotation angle	280±10°
Torque	50-350gf-cm
Resistance range	500Ω-1MΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	100V AC/DC

Snap-in type

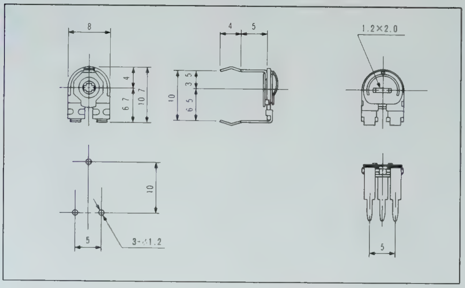
V8K4-1



Rotation angle	280±10°
Torque	50-350gf-cm
Resistance range	500Ω-1MΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	100V AC/DC

Units with Knob also available.

V8K4-11

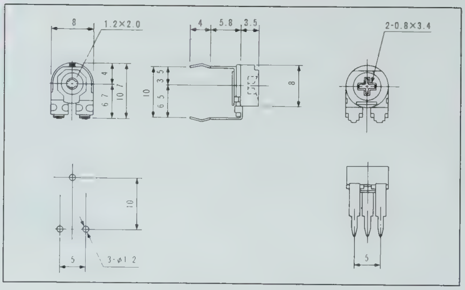


Rotation angle	280±10°
Torque	50-350gf-cm
Resistance range	500Ω-1MΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	100V AC/DC

Snap-in type

V8K4-11 (1S)

(with Dust-proof Knob)

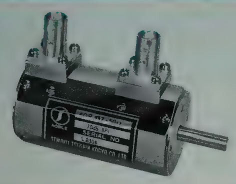


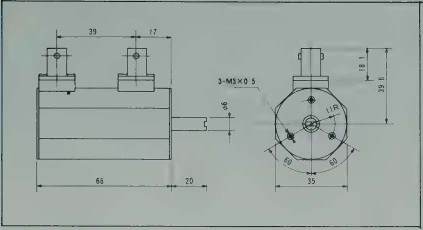
Rotation angle	280±10°
Torque	50-350gf-cm
Resistance range	500Ω-1MΩ (taper B)
Resistance tolerance	±30%
Power rating	0.1W
Voltage rating	100V AC/DC

Top-bottom adjustable type
Snap-in type

High Frequency Attenuators

ADR352

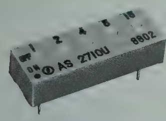


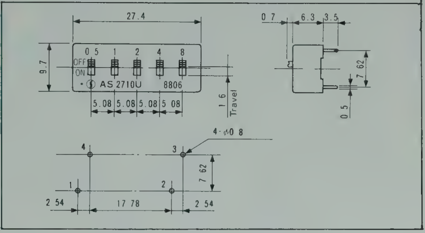


Impedance	50Ω, 75Ω
Attenuation	0 to 100dB (50Ω, 11 steps) 0 to 80dB (75Ω, 9 steps) (0.1dB, 1dB steps also possible)
Operating frequency range	DC to 1.5GHz (50Ω) DC to 1.0GHz (75Ω)
Power rating	500mW
VSWR	1.1 max.: 1GHz (50Ω) 1.2 max.: 1.5GHz (50Ω)
Connector	50Ω BNC, SMA 75Ω BNC, KC

AS2710

(Slide switch type)



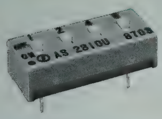


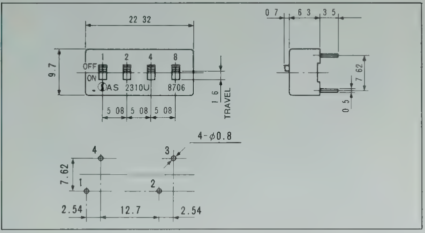
Impedance	600Ω ±2.5% unbalanced T
Attenuation	Combination of 0.5, 1, 2, 4, 8dB; 15.5dB total Combination of 1, 2, 4, 8, 16dB; 31dB total
Frequency	DC-150kHz
Power rating	50mW

Patent pending

AS2310

(Slide switch type)



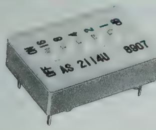


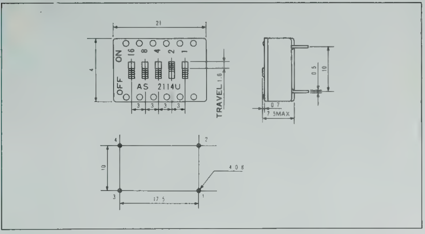
Impedance	600Ω ±2.5% unbalanced T
Attenuation	Combination of 1, 2, 4, 8dB; 15 dB total
Frequency	DC-150kHz
Power rating	50mW

Patent pending

AS2114

(Slide switch type)

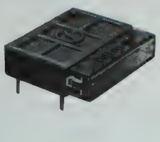


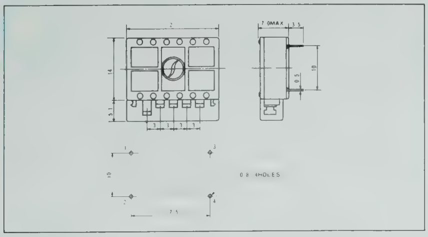


Impedance	600Ω ±2.5% balanced O 600Ω ±2% unbalanced T
Attenuation	Combination of 0.5, 1, 2, 4, 8dB; 15.5dB total Combination of 1, 2, 4, 8, 16dB; 31dB total
Frequency	DC-150kHz
Power rating	50mW

AS2105PL

(Pull switch type)

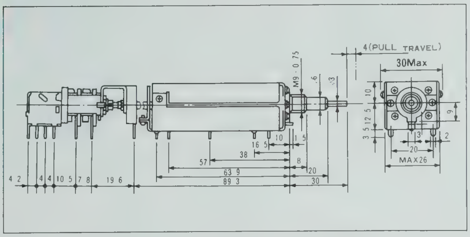




Impedance	600Ω ±2.5% balanced O 600Ω ±2% unbalanced T
Attenuation	Combination of 0.5, 1, 2, 4, 8dB; 15.5dB total Combination of 1, 2, 4, 8, 16dB; 31dB total
Frequency	DC-150kHz
Power rating	50mW

ADR255

(For oscilloscopes)



Operating frequency	DC-35, 50, 100, 200MHz
Attenuation ratio	1/1000-1/1
Input impedance	1MΩ
Input capacitance	5.5-22 pF
Step angle	30°

Please consult us for other configurations.

List of Power Switch Ratings

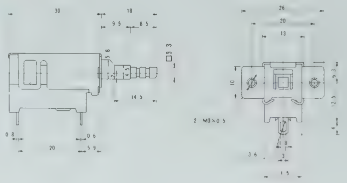
Operation	Combined Function	Model	Pole & Throw	Terminals		Listed under Safety Standards						
				Solder Lug	PCB Lug	Electronics Appliance	General Appliance	UL	CSA	VDE	SEMKO	BS
						Applicable Load Life Tests						
						Test B	Test A	Test C	Test C	Test D	Test D	Test D
						125VAC (A)				250VAC		
Rotary Types	w/16mm pot. (VB16L43)	B39S1	SPST	○	○	1	3	–	–	–	–	–
		A39S1				3	6	TV3	TV3			
	w/24mm pot. (V24L5)	B9SM		○	○	2	4	–	–			
		U9S1				3	6	TV3	TV3			
		U9SM				5	8	TV5	TV5			
		U12SV		○	○	–	–	–	–	4A/64A Class I	4A/64A Class I	4A/64A Class I
	w/o pot. (SD24L5)	B9MF	SPDT	○	–	1	3	–	–	–	–	–
		U12MF		○	–	3	6	TV3	TV3			
		B12DF	DPST	○	○	1	3	–	–			
		U12DF				3	6	TV3	TV3			
		U12DV				–	–	–	–	4A/64A Class I	4A/64A Class I	4A/64A Class I
		U12QF	DPDT	○	–	–	–	TV3	TV3	–	–	–
Pull-Push Types	w/16mm pot. (VB16L43)	U96S2	SPST	○	○	5	10	TV5	TV5	–	–	–
	w/24mm pot. (V24L5)	U85SM		○	○	5	10	TV5	TV5			
	w/o pot. (SD242)	U85DM	DPST	○	–	5	10	TV5	TV5			
		U85DR				–	–	–	–	6A/96A Class II	6A/96A Class II	6A/96A Class II
Push-Lock Types	SY11	A91S2	SPST	○		3	6	TV3	TV3	3A/48A Class Iμ	3A/48A Class Iμ	3A/48A Class Iμ
	SY13	U95S2	SPST	○		5	10	TV5	TV5	4A/128A Class Iμ	○	○
	SY13-4	U95D2	DPST	○		5	10	TV5	TV5	4A/128A Class Iμ	4A/128A Class Iμ	4A/128A Class Iμ

○ This mark shows that the safety standards have been applied for.

Power Switches

SY13-1(U95S2)

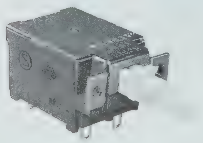
(Push-lock-push type)

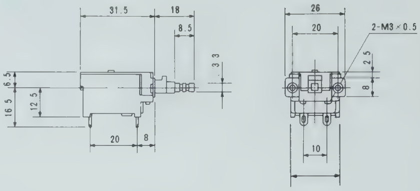


Operating travel	Lock travel: 1.1±0.3mm Full travel: 1.8±0.3mm
Operating force	400$^{+150}_{-100}$gf, return force: 30gf min.
Circuit	SPST
Rating	TV5, 4A/128A 250VAC
Standards met	UL, CSA, VDE (class Iμ)

SY13-4(U95D2)

(Push-lock-push type)





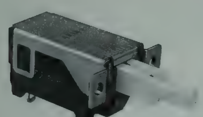
Operating travel	Lock travel: 2.1±0.5mm Full travel: 3.2±0.5mm
Operating force	500±150gf, return force: 100gf min.
Circuit	DPST
Rating	TV5, 4A/128A 250VAC
Standards met	UL, CSA, VDE, SEMKO, BS . . . (class Iμ)

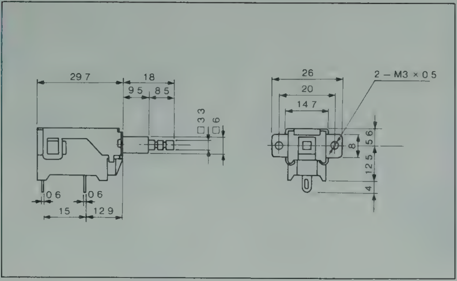
Signal (momentary) switch equipped type also available.

Power Switches

SY11-1(A91S2)

(Push-lock-push Type)

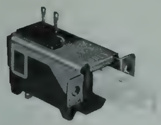


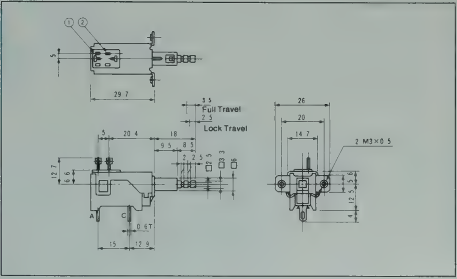


Operating travel	Lock travel: 2.5±0.5mm Full travel: 3.5±0.5mm
Operating force	350^{+150}_{-100}gf, return force: 30gf min.
Circuit	SPST
Rating	TV3, 3A/48A 250VAC
Standards met	UL, CSA, VDE, SEMKO, BS . . . (class Iμ)

SY11-3(A91S2)+S

Push-lock-push type with signal (momentary) switch

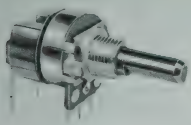


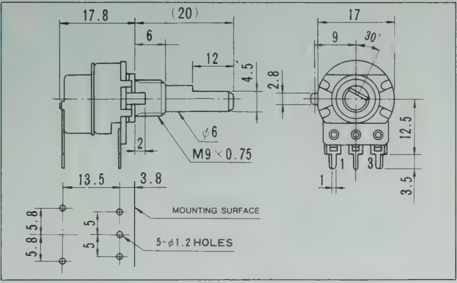


Operating travel	Lock travel: 2.5 ±0.5mm Full travel: 3.5±0.5mm
Operating force	450^{+150}_{-100}gf, return force: 30gf min.
Circuit	SPST
Rating	TV3, 3A/48A 250VAC
Standards met	UL, CSA,
Momentary Switch	
Circuit	1-circuit 1-position, 2-circuit 1-position
Rating	30VDC 0.1A

VB16L43PHS (A39S1PHD)

(Rotary Type)

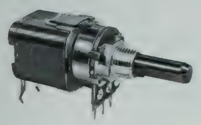


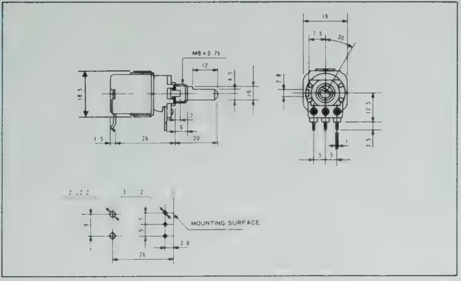


Operating angle	50°±10°
Operating force	800gf-cm max.
Circuit	SPST
Rating	TV3
Standards met	UL, CSA

VB16L43PHS (U9652PHD)

(Pull-push Type)

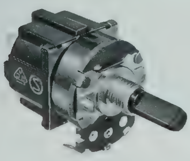


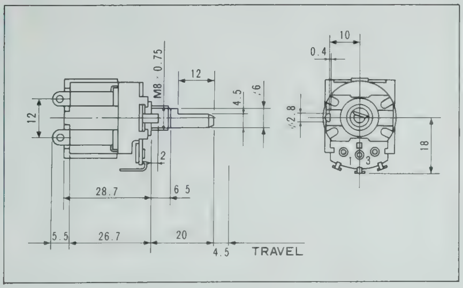


Operating travel	4.5mm
Operating force	150-800gf
Circuit	SPST
Rating	TV5
Standards met	UL, CSA

V24L5S(U65)

(Pull-push Type)

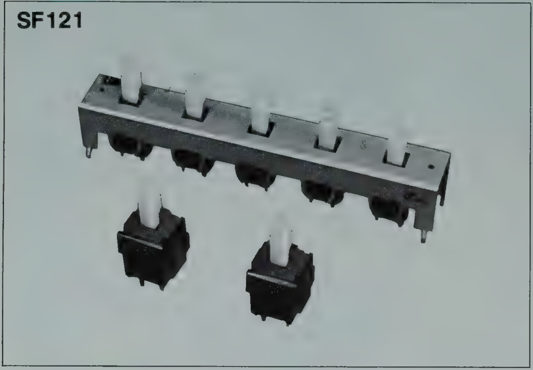




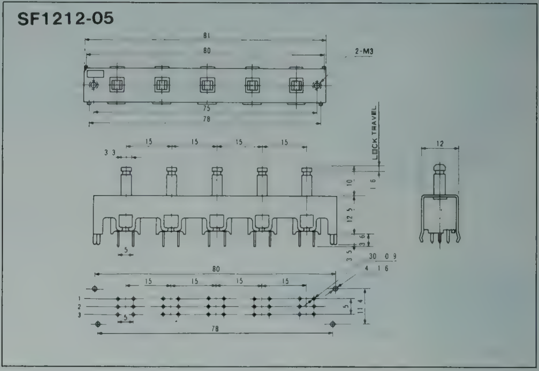
Operating travel	4.5mm
Operating force	150-800gf
Circuit	SPST, DPST
Rating	TV5, 250VAC 6A/96A
Standards met	UL, CSA, VDE, SEMKO, BS, . . . (class II)

Push Switch SF121 Series

SF121



SF1212-05



FEATURES

1. Self-cleaning type contacts exhibit excellent contact stability.
2. Stable performance within a wide temperature range.
3. Anti double locking type also available.
4. Selectable from among the single unit, lock-release, momentary ON and self-locking types.

APPLICATIONS

Car Electronics, Audio Equipment, Measuring Equipment, Office Equipment, etc.

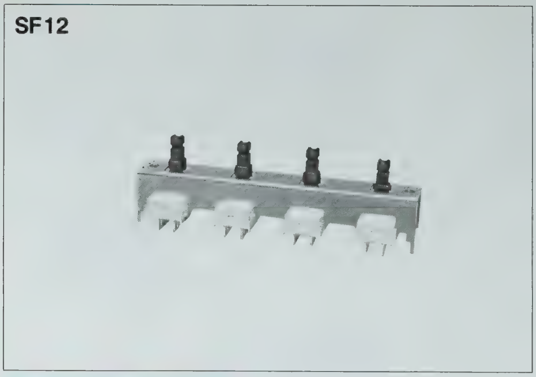
SPECIFICATIONS

Operating travel	Lock travel: 1.6±0.3mm Full travel: 2.5±0.3mm
Operating force	250±100gf
Circuit	2-circuit, 2-position/1-key
Rating	30VDC, 0.3A
Contact resistance	30mΩ max.
Operating temperature range	−30°C to +80°C
Storage temperature range	−40°C to +85°C

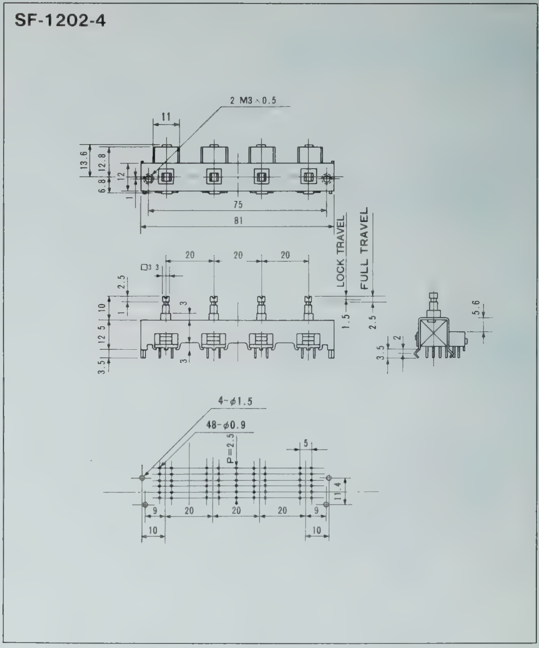
Long travel type SF122 at 2.5mm lock travel / 3.5mm full travel also available.

Push Switch SF12 Series

SF12



SF-1202-4



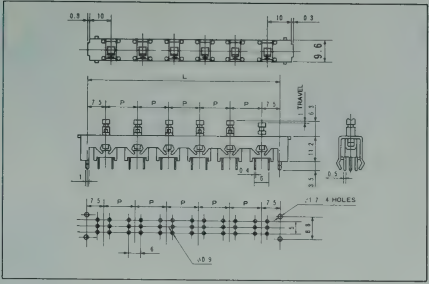
SPECIFICATIONS

Operating travel	Lock travel: 1.5mm Full travel: 2.5mm
Operating force	250±100gf
Circuit	2-circuit, 2-position 4-circuit, 2-position
Rating	30VDC, 0.3A
Contact resistance	20mΩ max.
Operating system	Individually or gang-operated (lock-release or non-lock)

Single units also available.

1 mm Travel Tactile Switch SK Series

SK1100 (Self-lock)



Mounting Pitch (Dimension L)

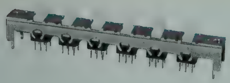
Unit: mm

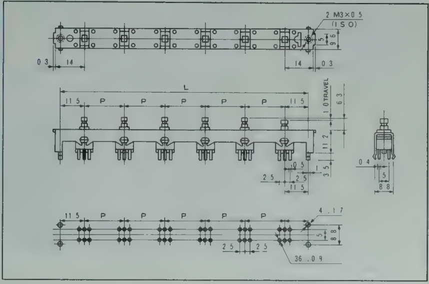
Key pitch \ Key count	2	3	4	5	6	7
P=12.5	27.5	40.0	52.5	65.0	77.5	90.0
P=15	30.0	45.0	60.0	75.0	90.0	105.0

Key pitch \ Key count	8	9	10	11	12
P=12.5	102.5	115.0	127.5	140.0	152.5
P=15	120.0	135.0	150.0	—	—

Lock-release and non-lock can be combined together.

SK1003 (Lock-release)
SK1004 (Non-lock)





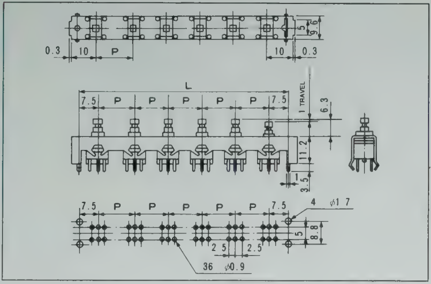
Mounting Pitch (Dimension L)

Unit: mm

Key pitch \ Key count	2	3	4	5	6	7
P=12.5	35.5	48.0	60.5	73.0	85.5	98.0
P=15	38.0	53.0	68.0	83.0	98.0	113.0

Key pitch \ Key count	8	9	10	11	12
P=12.5	110.5	123.0	135.5	148.0	160.5
P=15	128.0	143.0	158.0	—	—

SK1005 (Lock-release)
SK1006 (Non-lock)



Mounting Pitch (Dimension L)

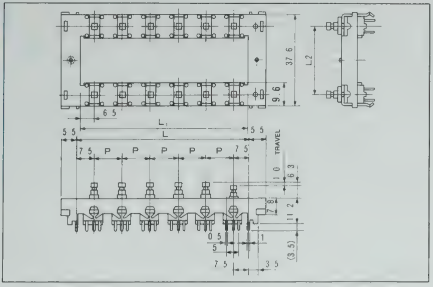
Unit: mm

Key pitch \ Key count	2	3	4	5	6	7
P=12.5	27.5	40.0	52.5	65.0	77.5	90.0
P=15	30.0	45.0	60.0	75.0	90.0	105.0

Key pitch \ Key count	8	9	10	11	12
P=12.5	102.5	115.0	127.5	140.0	152.5
P=15	120.0	135.0	150.0	—	—

Lock-release and non-lock can be combined.

SK2003 (Lock-release)



Mounting Pitch

Unit: mm

Keys	Key pitch P	Dimension L	Dimension L1
8 (4-key x 2)	12.5	52.5	50.5
12 (6-key x 2)	12.5	77.5	75.5
14 (7-key x 2)	12.5	90.0	88.0

Dimension L2 = 28
(L2 = 15 or 20mm also available)

SPECIFICATIONS

Operating force	Lock-release: 140±50gf (return force 20gf min.) Non-lock: 140±60gf (return force 10gf min.) Self-lock: 160±60gf (return force 20gf min.)
Operating travel	1±0.3mm (full travel of self-lock type: 1.8±0.3mm)
Rating	30VDC, 0.1A (resistive load)
Contact resistance	100m Ω max. when measured with 1 kHz micro-ohmmeter

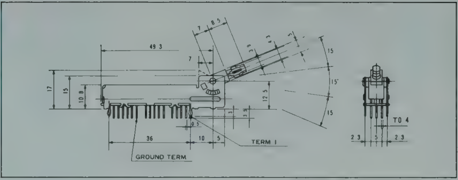
CAUTION

- Since this is a tactile switch with a short 1 mm travel, it should be employed together with a knob having maximum height of 3 mm from the front panel surface. In addition, the smaller the knob, generally the better. Before using the parts, please be sure to submit application drawings for confirmation of the design approvability.

Switches

SXE22

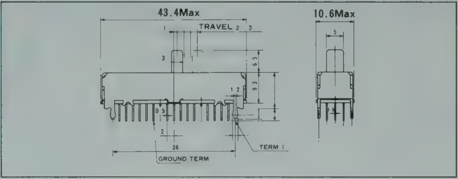
(Built-in Grounding Circuit)



Swtiching angle	15°
Circuit configuration	6-circuit 4-position
Ratings	Switching circuit: 30VDC, 0.3A Grounding circuit: 30VDC, 0.1A

SLE10

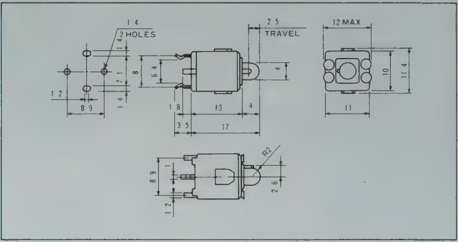
(Built-in Grounding Circuit)



Travel	2.0 mm
Circuit configuration	6-circuit 4-position
Ratings	Switching circuit: 30VDC, 0.3A Grounding circuit: 30VDC, 0.1A

SQ125

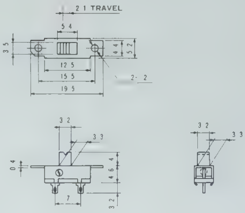
(Door Switch)



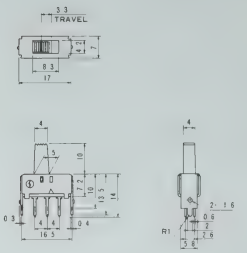
Travel	2.5±0.3mm
Operating force	80±40gf
Return force	10gf min.
Circuit configuration	Push-on type (SQ125-1) Push-off type (SQ125-2)
Rating	20VDC, 20mA

Slide Switches

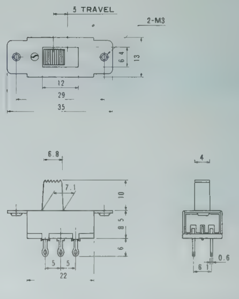
SL56



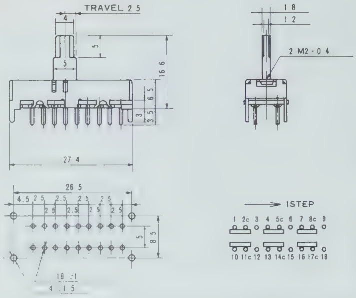
SL7-5 (PH)



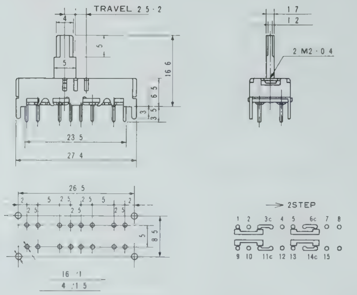
SL13-8



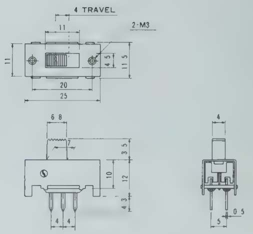
SL106-1



SL106-2



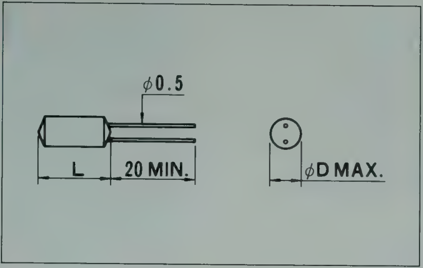
SL114



Polystyrene Capacitors

CQ09S(C)

Copper foil electrode equipped type



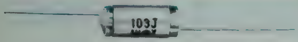
Rated voltage 125V	Dimensions (mm)	
Capacitance range	L	D
10–270pF	15±2	6.3
330–1,000pF		7.1
1,200–1,800pF		8.0
2,200–2,700pF		9.0
3,300–3,900pF	20±2	10.0
4,700–5,600pF		11.2
6,800pF–0.01 μF		12.5

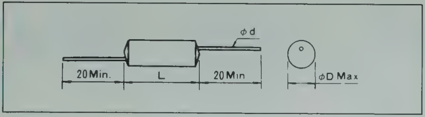
Formed lead type and 250V (rated voltage) type also available.

FEATURES

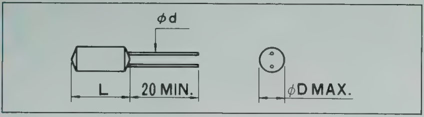
1. Copper foil electrodes and annealed copper leads for high sound quality applications.
2. Film is thicker than in conventional polystyrene capacitors for higher sound quality capabilities.
3. Non-inductive and epoxy coated types available also for still higher sound quality applications.
4. Marking of outer foil (positive) termination also possible.

CQ08S(S)





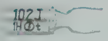
CQ09S(S)

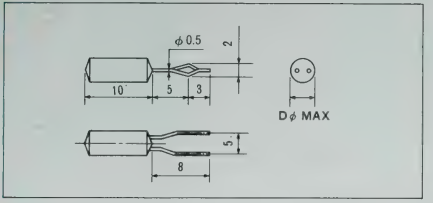


Rated voltage 50V	Dimensions (mm)		
Capacitance range	L	D	d ±0.05
10–180pF	8±1	5.6	0.4
200—750pF	9±1	5.6–6.3	0.4
820–4,700pF	10^{+1}_{-2}	6.3–9.0	0.4
5,100pF—0.01 μF	18^{+2}_{-1}	8.0–9.0	0.5
0.015–0.033 μF	25^{+3}_{-2}	10.0–11.2	0.5
0.047 –0.1 μF	31.5^{+3}_{-2}	12.5–16.0	0.5

Types rated at 125, 250, 500V also available

CQ09S(SN-IF)



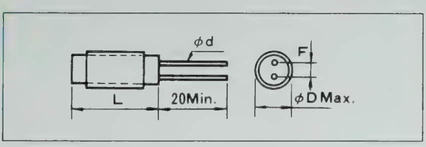


Rated voltage 50V	Dimensions (mm)
Capacitance range	D
10–1,000pF	6.3
1,100–2,200pF	7.1
2,400–3,300pF	8.0
3,600–4,700pF	9.0
5,100–6,800pF	10.0
7,500pF–0.01 μF	11.2

Taped leads also available.

CQ09S(X)

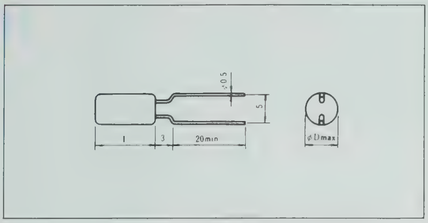
Humidity and thermal shock proof type



Rated voltage 50V	Dimensions (mm)			
Capacitance range	L	D	d ±0.05	F
100–680pF	13±1	6.3–7.1	0.4	3.5
820pF–0.01 μF	18±1	7.1–11.2	0.5	3.5, 5

Polypropylene Capacitors

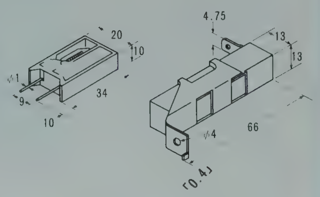
CQ15P

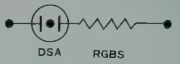


Rated voltage 50V	Dimensions (mm)	
Capacitance range	L	D
100—1,000pF	7.0^{+2}_{-1}	5.6
1,100—3,300pF	7.0^{+2}_{-1}	6.5
3,600pF—0,01 μF	9.0^{+2}_{-1}	8.0
0.011—0.027 μF	11.0^{+2}_{-1}	9.0
0.03—0.047 μF	14.0±2	10.0
0.051—0.068 μF	14.0±2	11.0
0.075—0.1 μF	14.0±2	12.0

Surge Absorber DSAR Series

DSAR



Flashover voltage	180-3600V depending on model
Insulation resistance	$10^8\ \Omega$ min.
V-t characteristics	$1\ \mu$sec max. ($1.2 \times 50\ \mu$sec waveform)
Electrostatic capacity	1pF max.
Internal connection	 DSA RGBS DSA Discharge element RGBS Continuous current blocking resistor

FEATURES

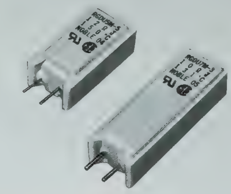
1. Uses open-mode, field-effect type discharge element.
2. Large surge withstanding capacity and rapid response.
3. High insulation resistance with minimized electrostatic capacity.
4. Stable against repeated surges and changes in environmental conditions.
5. Destruction due to over currents results in open circuit, with no short-circuiting.
6. Meets UL standards.

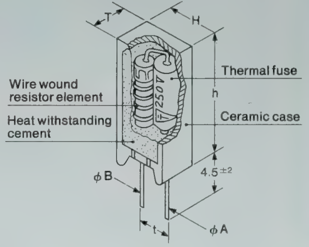
APPLICATIONS

Microwave Ovens, Hot Water Supply System, Air Conditioners, Office Equipment, etc.

Thermal Fuse Resistor RGD-M RGDU-M Series

RGDU-M





Model	Rating (A)	Dimensions (mm)						Fusing Temperature Code	Resistance Range (Ω)
		H	T	h	t	A	B		
RGD 2M	2	12	7	21	5	0.6	0.8	0 (95°C) 1 (110°C) 3 (126°C) 4 (130°C) 5 (145°C)	0.22～ 270
RGD 3M		12	8	26	5	0.6	0.8		0.27～ 680
RGD 5M		13	9	26	5	0.6	0.8		0.27～ 680
RGD 7M		13	9	38.5	5	1.0	1.0		0.68～1200
RGD 10M		16	13	35	7.5	1.0	1.0		1.0 ～1800
RGDU 5M		13	9	26	5	0.6	0.8	1 (110°C) 3 (126°C) 4 (130°C) 5 (145°C)	1.0 ～ 100
RGDU 7M		13	9	38.5	5	1.0	1.0		1.0 ～ 100

UL Standard 1412, File No. E62418. (RGDU Types)

CSA Standard File No. LR85971-The Fusing temperatures are: 1. (115°C), 3 (131°C). 4 (135°C), 5 (150°C).

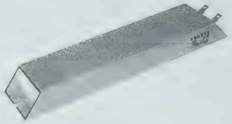
FEATURES

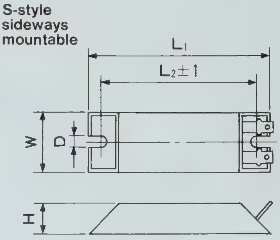
1. This is an integrated safety resistor that consists of a wire wound cement resistor and a built-in thermal fuse of the fusible alloy type.
2. Exhibits stable fusing and high surge withstanding characteristics.

APPLICATIONS

Switching Regulators (for prevention of Thyristor trouble), etc.

Metal-Clad Resistor RGH Series



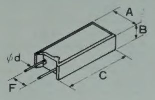


All dimensions in mm.

Model	Rating	L_1	L_2	W	H	D	Weight (approximate)
RGH 60	60W	115	100	40	20	5.3	110g
RGH 80	80W	140	125	40	20	5.3	160g
RGH 100	100W	165	150	40	20	5.3	200g
RGH 120	120W	190	175	40	20	5.3	240g
RGH 150	150W	215	200	40	20	5.3	290g
RGH 200	200W	215	200	50	25	5.3	460g
RGH 250	250W	240	225	50	25	5.3	540g
RGH 300	300W	215	200	60	30	5.3	700g
RGH 400	400W	265	250	60	30	5.3	930g
RGH 500	500W	335	320	60	30	5.3	1000g
RGH1000	1000W	400	385	100	50	5.3	3000g

Cement-Filled Fixed Resistors

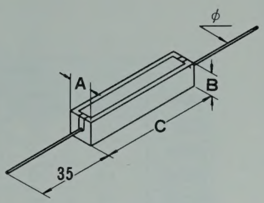
RGG



Model	Power Rating (W)	Resistance Range (Ω)	Dimensions (mm)				
			A	B	C	F	d
RGG 2	2	0.22—270	11	7	21	5	0.8
RGG 3	3	0.27—680	12	8	26	5	0.8
RGG 5	5	0.27—680	13	9	26	5	0.8
RGG 7	7	0.68—1,200	13	9	38.5	5	1.0
RGG10	10	1—1,800	16	13	35	7.5	1.0
RGG20	20	1.5—2,700	20	13	45	7.5	—

The RGG20 terminal forms differ so consult us for further details.

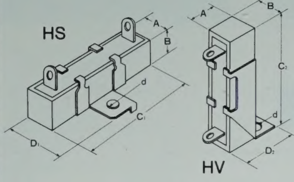
RGB-L
RGU-L



Model		Power Rating (W)	Resistance Range (Ω)	Dimensions (mm)		
				A/B	C	ϕ
RGB 2	(RGU 2)	2	0.22—270(56)	6.3	18	0.8
RGB 3	RGU 3	3	0.27—680	8	23	0.8
RGB 5	RGU 5	5	0.27—680	9.5	23	0.8
RGB 7	RGU 7	7	0.68—1,200	9.5	36	0.8
RGB10	RGU10	10	1—1,800	9.5	48	0.8
RGB15	RGU15	15	1.2—2,200	13	48	1.0
RGB20	RGU20	20	1.5—2,700	13	63.5	1.0

Note: Type RGU's are the UL listed "fusing and temperature limiting resistors" (File No. E62418).

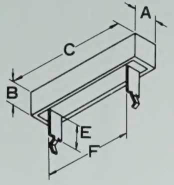
RGB-H, HS, HV
RGU-H, HS, HV



Model		Power Rating (W)	Resistance Range (Ω)	Dimensions (mm)					
				A/B	C_1	C_2	D_1	D_2	ϕd
RGB10H	RGU10H	10	1—1,800	9.5	48	48	25	23.5	4
RGB15H	RGU15H	15	1.2—2,200	13	48	57	28.5	27	4
RGB20H	RGU20H	20	1.5—2,700	13	63.5	63.5	28.5	27	4
RGB30H	RGU30H	30	1.8—3,300	19	75	83	38	36	4.2
RGB40H	RGU40H	40	2.2—4,700	19	90	90	38	36	4.2

Type RGU are UL-listed fusing and temperature limiting resistors (under file No. E62418).
HS is equipped with a horizontal mounting bracket, and HV with a vertical mounting bracket.

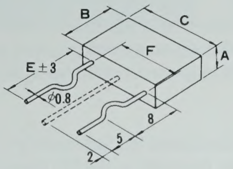
RGB-PH
RGU-PH



Model		Power Rating (W)	Resistance Range (Ω)	Dimensions (mm)			
				A/B	C	E	F
RGB5PH	RGU5PH	5	0.27—680	9.5	23	10	10
RGB7PH	RGU7PH	7	0.68—1,200	9.5	36	10	22.5
RGB10PH	RGU10PH	10	1—1,800	9.5	48	10	35

Note: Type RGU's are the UL listed "fusing and temperature limiting resistors" (File No. E62418).
Other self-standing terminals also available, such as PM (pointed pins) and PK (long pins).

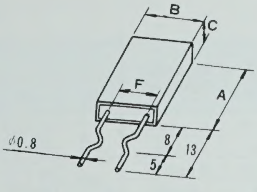
RGC



Model	Power Rating (W)	Resistance Range (Ω)	Dimensions (mm)					Element Count
			A	B	C	E	F	
RGC2	2	0.1—1	5	9	14±1	13	9	Single
RGC3	3	0.1—1	5	13	14±1	13	9	
RGC5	5	0.1—1	5	17	14±1	13	9	
RGC22	2+2	0.1—1	5	9	26±1.5	13	18	Twin
RGC33	3+3	0.1—1	5	13	26±1.5	13	18	
RGC55	5+5	0.1—1	5	17	26±1.5	13	18	
RGC77	7+7	0.05—0.5	6	21	26±1.5	13	18	

Twin-type has two elements at very close resistance values and the same TCR, and is best suited for the final-stage emitters resistor of a stereo power amplifier.

RGCW

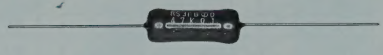


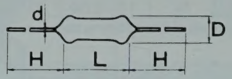
Model	Power Rating (W)	Resistance Range (Ω)	Dimensions (mm)			
			A	B	C	F
RGCW2	2	1—50	10	15	6	9
RGCW3	3	1—50	13	15	6	9
RGCW5	5	1—100	18	15	6	9

Metal-Oxide Fixed Resistors

RSFB

(Flame Proof Coated)



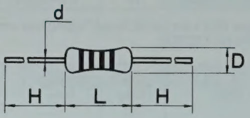


Model	Rating				Dimensions (mm)			
	Rated power 70°C (W)	Voltage rating (V)	Resistance range (Ω)	Resistance tolerance	L±1	D±1	d±0.05	H
RS1/2FB	0.5	250	0.22- 68k	Standard: ±5% (Code J) On request: ±2% (Code G)	9	2.8	0.6	27 min.
RS1FB	1.0	350	0.22-100k		12	4.0	0.8	27 min.
RS2FB	2.0	350	0.22-120k		15	5.5	0.8	38±3
RS3FB	3.0	500	10-150k		24	8.5	0.8	38±3

1/2 W to 1 W is 3.3 Ω maximum and 2 W is 4.7 Ω are the RN types.

RSMFB

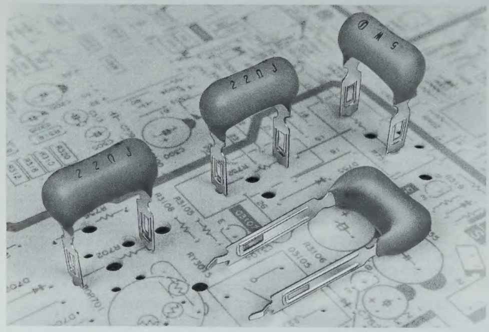
(Flame Proof Coated)
(Compact Type)

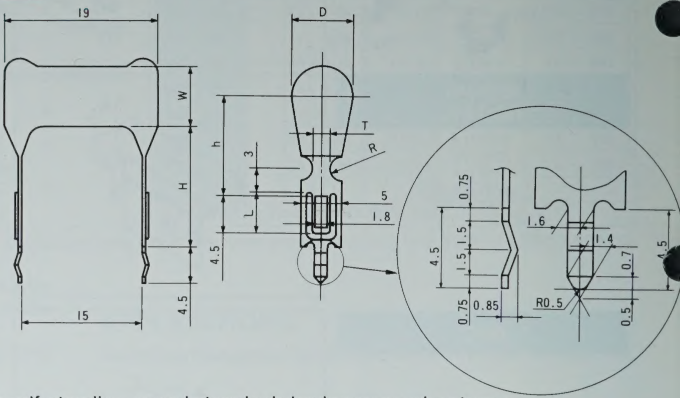


Model	Rating				Dimensions (mm)			
	Rated power 70°C (W)	Voltage rating (V)	Resistance range (Ω)	Resistance tolerance	L	D	d±0.05	H
RSM1/2FB	0.5	250	0.22-47k	Standard: ±5% (Code J) On request: ±2% (Code G)	6.4	2.3±0.5	0.6	27 min.
RSM1FB	1.0	350	0.22-68k		9.0	2.8±0.5	0.8	27 min.
RSM2FB	2.0	350	0.22-100k		12.0	4.0±1	0.8	27 min.
RSM3FB	3.0	350	0.22-100k		15.0	5.5±1	0.8	38±3
RSM5FB	5.0	500	22-100k		24.0	8.5	0.8	38±3

RNM type (metal film type) is supplied for 1/2W to 3W, ratings at less than 10 Ω.

Vertical Mount/Snap-in Terminal RSSFB





Features

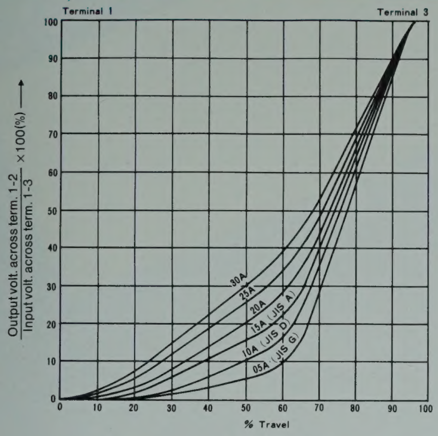
1. These vertical mount resistors are equipped with self-standing, snap-in terminals having many advantages:
   - (a) The surface area of the terminals has been increased which enhances their heat dissipating capacity.
   - (b) The difference in thermal conductivity between the lead terminal material (Cu) and the snap-in terminal (Fe) creates a lower board temparature rise.
   - (c) Valuable board space is greatly increased.
   - (d) Increased terminal strength in comparison to standard axial leaded resistors.
2. Available in two mounting heights (measured from under the body to the PC Board): 15 mm (H_1) and 25 mm (H_2)
3. These resistors exhibit a low inductive component with excellent high frequency response.
4. Resistors below 10 Ω in value do not require trimming, therefore it creates fewer areas of any potential difference in voltage, and will be capable of withstanding higher in-rush current levels.

Ratings and Dimensions

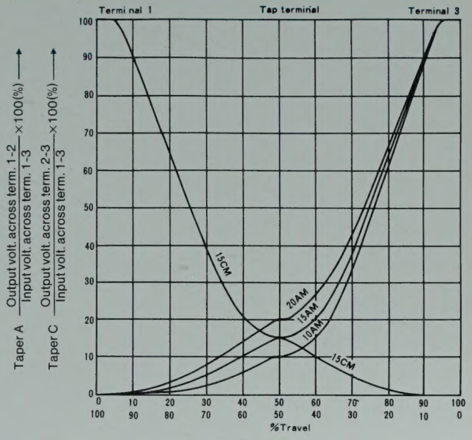
Model	Power Rating (W)	Maximum Operating Voltage (V)	Maximum Continuous Overload Voltage (V)	Maximum Intermittent Overload Voltage (V)	Resistance Range (Ω) E-12 Series	Resistance Tolerance	Dimensions (mm)						
							D	H	h	W	T	R	L
RSS3FB	3	500	600	750	1 to below 10	K (±10%)	7.5	H_1=15 H_2=25	h_1=12 h_2=22	7.5	T_1=2.0 T_2=3.0	R_1=1.5 R_2=1.0	L_1=5 L_2=15
					10~100 K	J (±5%)							
RSS5FB	5	500	800	1500	1 to below 10	K (±10%)	8.0	H_1=15 H_2=25	h_1=12 h_2=22	8.5	T_1=2.0 T_2=3.0	R_1=1.5 R_2=1.0	L_1=5 L_2=15
					10~4.7 K	J (±5%)							

Potentiometer Standard Resistance Tapers

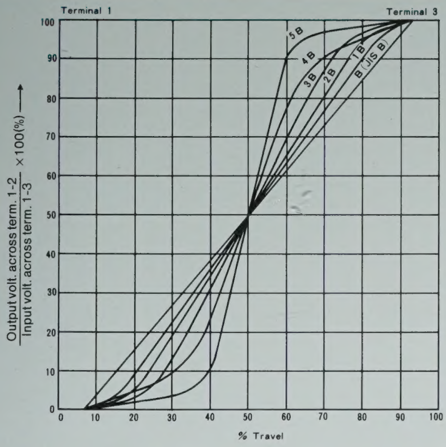
A Series



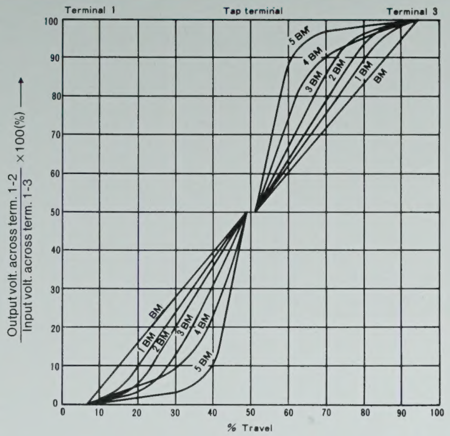
A, C Series w/50% Tap



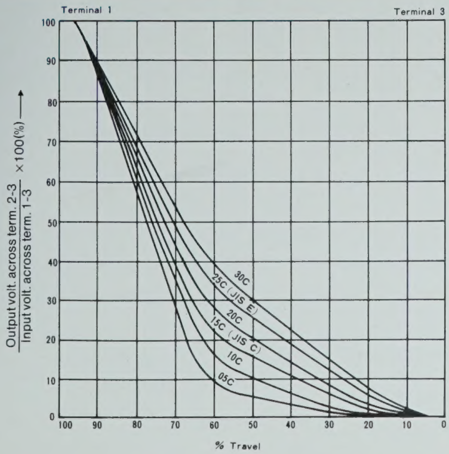
B Series



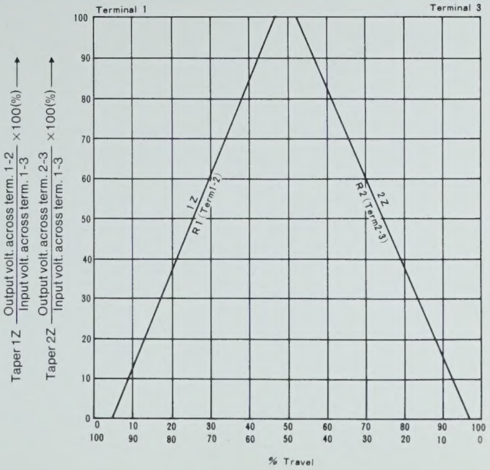
B Series w/50% Tap



C Series



Z Series



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